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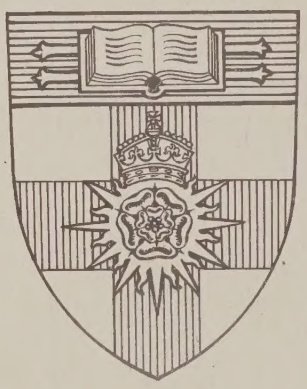

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REPORTS

FROM

COMMISSIONERS, INSPECTORS,

AND OTHERS:

FIFTY-ONE VOLUMES.

— (*19.*) —

EDUCATION (SCOTLAND)—*continued.*

SCIENCE AND ART; GOVERNMENT LABORATORY; NATIONAL GALLERY; NATIONAL PORTRAIT GALLERY; NATIONAL PHYSICAL LABORATORY.

Session

29 *January* 1908 —— 21 *December* 1908.

VOL. XXIX.

1908.

REPORTS

FROM

COMMISSIONERS, INSPECTORS,

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FIFTY-ONE VOLUMES:—CONTENTS OF THE

NINETEENTH VOLUME.

N.B.—*THE* Figures *at the* beginning of the line, *correspond with the* N° *at the foot of each* Report; *and the* Figures *at the* end of the line, *refer to the* Paging *of the Volumes arranged for The House of Commons.*

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THIRTY-FIFTH
ANNUAL REPORT

BY

THE ACCOUNTANT FOR SCOTLAND

TO THE

SCOTCH EDUCATION DEPARTMENT.

Presented to both Houses of Parliament by Command of His Majesty.

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1908.

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REPORT.

ACCOUNTANT'S OFFICE FOR SCOTLAND,
33 YORK PLACE, EDINBURGH,
23rd May 1908.

To the Secretary of the
Scotch Education Department.

SIR,

I have the honour to submit, in terms of Section 51 of the Education (Scotland) Act, 1872, the Annual Report of the Accountant for Scotland to the Scotch Education Department, prepared from returns made to me by the School Boards in Scotland, setting forth the amount of the receipts and expenditure of each Board for the year ended at Whitsunday 1907.

The number of School Boards was 970, the same as in the last Report.

The Treasurers of these Boards, in terms of Sections 48 and 49 of the Act, have transmitted to this office an Account, showing their money receipts and payments, the state of the funds and property under their charge, and the amount of liabilities at Whitsunday, together with the vouchers, with the exception of the School Board of Scoonie (Fife). In this case the Board have not been able to produce the whole of the vouchers owing to the death of the late Treasurer, in whose possession they were, but among whose effects no trace of them could be discovered. The new Treasurer supplied me with all information in his power, and with the help of the minute book, cash book, and ledger of the School Board I have been enabled to pass the Account. Accounts have also been transmitted to me by the Treasurers of combination schools under Section 42, in all cases where the income and expenditure in connection with these schools have not been included in the Accounts of one or other of the contributing Boards.

In each case a certification was annexed to the Account, and signed by the Chairman, to the effect that the Account had been submitted to the School Board for examination, and had been approved of, and that the Board had satisfied themselves, by reference to the Bank Pass Book, that the balances at the beginning and at the end of the Account were correctly stated.

The following ten School Boards had no schools under their charge, viz.:—Bathgate (Burgh), Burntisland (Landward), Dumbarton (Landward), Forres (Landward), Greenock West Parish (Landward), Kinnoull, Kirkwall (Burgh), Kirkwall (Landward) and St. Ola, Sheuchan, and Tenandry.

Income.

The total income, as set forth in the Accounts examined and passed by me, was £3,391,234, 18s. 4d., derived from the following sources, viz.:—

School Fees, and Books, &c., sold to children,	£47,834	12	5
Grants for Relief of Fees,	368,133	15	0
Grants from the Scotch Education Department,	1,154,736	13	3
Grants from County Councils, &c., for Technical Education, under Local Taxation (Customs and Excise) Act, 1890,	8,055	18	6
Grants from Committees of Counties and Burghs for Secondary Education, under Section 2 (1) (*b*) of Education and Local Taxation (Scotland) Act, 1892, &c.,	27,272	14	6
School Rate,	1,313,583	15	8
Loans raised,	396,306	11	7
Interest from Endowments,	9,573	14	1
Contributions under Section 42,	9,561	0	5
Other sources,	56,176	2	11
	£3,391,234	18	4

This amount is £337,321, 8s. 10d. more than the income of the previous year, or, deducting loans in each case, the amount is £263,911, 0s. 6d. greater than that of the previous year—the increase being accounted for greatly in the larger amount entered under Grants from the Department, partly from an increase of the amount received from Rates, and partly from an increase in Miscellaneous Income.

The proportions which the several sources of income, excluding loans for capital charges, bear to the total income for each of the three years 1904–05, 1905–06, and 1906–07 are given in the following Table:—

	1904–05.	1905–06.	1906–07.
	Per cent.	Per cent.	Per cent.
School Fees, Sale of Books, &c., to Children, and Grants in Relief of Fees,	15·3	15·2	13·9
Grants from the Scotch Education Department,	38·2	37·1	38·6
Rates,	43·2	44·8	43·9
Other sources of Income,	3·3	2·9	3·6

The proportion of the total receipts raised by loans in each of the three years was:—

	1904–05.	1905–06.	1906–07.
	Per cent.	Per cent.	Per cent.
Loans, ...	13·9	10·6	11·7

School Fees, &c., and Grants in Relief of Fees.—The sums entered in the Accounts as having been received amount together to £415,968, 7s. 5d., an increase of £746, 14s. 2d. over the amount in the previous year, and the details are as follows:—

School Fees, ...	£32,708	11	3
Books and Material sold to Children, . .	15,126	1	2
Grants in Relief of Fees, ...	368,133	15	0
	£415,968	7	5

The amounts entered under the head of Fees consist partly of sums received by School Boards during the year from pupils in connection with special classes in a number of schools, partly of sums collected in certain schools where fees have still continued to be charged under sanction of the Department under Article 134 of the Code, and a portion of the fees received from pupils attending the classes held under the Continuation Class Code, while the amounts entered under the head of Grants in Relief of Fees represent the sums paid over by the Department to School Boards, during the year to 15th May 1907, as the Capitation Grant in relief of fees.

Grants from the Scotch Education Department.—The total sum appearing in the Accounts as having been received during the year in Grants, which include Grants under Day Schools Code, Grants under General Aid Grant Minute, Grants under Continuation Class Code, Additional Grants under Section 67, and Special Grants under Minute of 19th July 1906, was £1,154,736, 13s. 3d., being £142,228, 13s. 6d. in excess of the amount entered in the previous year's Report.

The Grants under the Department Minute of 4th March 1895, and 19th March 1906, &c., with respect to certain parishes in the Highlands and Islands, and which are included under the head of "Other Sources" of Income, amounted to £1,500, and were received by the following Boards:—

Inverness.—Duirinish, . . .	£200	0	0			
Harris, . . .	530	0	0			
Sleat, . . .	60	0	0			
Strath, . . .	60	0	0			
				£850	0	0
Ross and Cromarty.—Barvas, .	£100	0	0			
Lochs, . .	350	0	0			
Uig, . .	200	0	0			
				650	0	0
				£1,500	0	0

The details are as follows :—

Grants under Day Schools Code, including Drawing Grants,	£825,954	10	5
Grants under General Aid Grant Minute,	173,631	5	2
Grants under Continuation Class Code,	73,816	13	11
Additional Grants under Section 67 as now amended and Special Grants under Minute of 19th July 1906 (received by 272 School Boards),	81,334	3	9
	1,154,736	13	3
Grants under Minute of 4th March 1895, &c. (received by seven School Boards),	1,500	0	0
	£1,156,236	13	3

In the case of eight School Boards, irrespective of the ten which have no schools under their charge, there is no sum appearing as annual Grant in the Accounts for the year, in consequence of changes in the dates of inspection, or owing to the Grants, although earned, not having been received by the Board as at the date of closing the Accounts.

Grants by the Department made from the General Aid Grant under General Aid Grant Minutes towards the erection and equipment of new buildings in connection with Secondary and Technical Education, are included under the head of "Other Sources" of Income amounting to £21,950, and were received by the following Boards, viz. :—

Kilmarnock (B) (Ayr), towards the erection of Technical School,	£7,550	0	0
Stornoway (Ross), towards the erection and equipment of Nicolson Institute,	6,400	0	0
Galashiels (B) (Selkirk), towards the erection of South of Scotland Central Technical School,	8,000	0	0

In connection with the above Grant to Galashiels Burgh Board it may be stated that sums amounting to £8,242, 6s. were received during the year as subscriptions towards the erection of the South of Scotland Central Technical School and which are also included under the head of "Other Sources" of Income.

Technical Education Grants.—Town and County Councils were empowered by the Local Taxation (Customs and Excise) Act of 1890, followed by the Education and Local Taxation Account (Scotland) Act, 1892, to contribute towards the furtherance of Technical Education. The sums received by School Boards from these bodies under this head during 1906–07 amount to £8,055, 18s. 6d.

Secondary Education Grants.—Under the Education and Local Taxation Account (Scotland) Act above referred to, Section 2 (1) (*b*), a sum is annually available for Secondary Education. The distribution of this sum by Burgh and County Committees in the districts under their control was provided for by the Department Minute of 10th June 1897, as amended by that of 30th April

1900, and relative schemes approved of by the Department. The amount received by School Boards under this head during the year was £27,272, 14s. 6d. In addition to this amount, there was received on account of Higher Class Schools a sum of £15,568, 15s. 11d.

School Rate.—The sums received during 1906–07 by the Treasurers of School Boards from the Rating Authorities amounted to £1,313,583, 15s. 8d., an increase of £89,472, 4s. 3d. on the amount of the previous year.

The following Tables give the amounts received by the Treasurers of School Boards from the Rating Authorities during the three years to Whitsunday 1907:—

	1904–05.	1905–06.	1906–07.
	£	£	£
In Burghs, ...	564,716	611,737	650,360
In Parishes and School Districts,	569,526	612,375	663,224
Total, . .	1,134,242	1,224,112	1,313,584

These sums represent an average rate per £ on the rateable value of the districts:—

	1904–05.	1905–06.	1906–07.
	d.	*d.*	*d.*
In Burghs, ...	12·28	13·22	14·21
In Parishes and School Districts,	9·60	10·19	10·96
Total, . .	10·77	11·52	12·36

The following Table shows the amount received from the Rating Authority in each of the counties in Scotland during the three years ending Whitsunday 1907, and the average rate per £ which the amounts represent on the rateable value of each county:—

County.	Amount received from Rating Authority.			Average Rate per £ on rateable value.		
	1904–05.	1905–06.	1906–07.	1904–05.	1905–06.	1906–07.
	£	£	£	*d.*	*d.*	*d.*
Aberdeen,	87,443	86,921	90,585	12·58	12·42	12·90
Argyll { Mainland,	17,279	18,929	19,387	10·71	11·60	11·90
Argyll { Insular,	3,626	3,739	3,941	11·51	12·09	12·77
Ayr,	54,096	57,905	65,155	9·63	10·19	11·28
Banff,	9,956	10,073	10,828	10·37	10·40	11·20
Berwick,	7,747	8,592	9,166	6·77	7·51	7·97
Bute,	4,569	5,150	5,181	7·58	8·54	8·52
Caithness,	6,432	7,511	7,348	12·77	14·98	15·23
Clackmannan,	6,570	8,030	8,500	11·35	13·71	14·46
Dumbarton,	29,302	31,870	35,518	11·13	11·78	12·44
Dumfries,	18,063	19,059	21,106	8·45	8·91	9·92
Edinburgh,	162,542	174,358	178,339	10·57	11·14	12·16
Elgin,	9,907	10,299	11,295	10·99	11·34	12·47
Fife,	47,346	49,617	53,914	9·64	9·99	10·54
Forfar,	61,906	63,455	68,180	10·42	10·68	11·38
Haddington,	9,417	9,512	10,213	7·39	7·47	7·81
Inverness { Mainland,	14,375	14,467	16,009	9·64	9·63	10·81
Inverness { Insular,	2,815	3,428	4,851	13·33	16·63	23·76
Kincardine,	7,468	6,955	7,447	8·45	7·97	8·60
Kinross,	1,592	1,734	1,662	6·58	6·58	6·21
Kirkcudbright,	9,987	10,510	10,852	7·76	8·15	8·47
Lanark,	351,275	397,684	427,773	11·98	13·43	14·40
Linlithgow,	15,615	16,894	17,731	10·16	10·70	11·14
Nairn,	1,410	1,490	1,655	7·65	8·01	9·05
Orkney,	2,240	2,171	2,999	8·12	7·67	10·51
Peebles,	5,290	4,838	5,207	10·53	9·87	8·38
Perth,	37,158	35,777	38,402	8·68	8·40	8·94
Renfrew,	67,144	75,298	84,767	10·89	11·93	13·04
Ross { Mainland,	8,672	10,140	11,178	9·08	10·58	11·67
Ross { Insular,	1,195	1,398	1,953	9·30	10·67	17·66
Roxburgh,	11,775	11,549	12,462	7·99	7·84	8·35
Selkirk,	5,082	6,408	6,108	9·89	12·48	11·33
Shetland,	2,090	2,230	2,254	12·78	13·09	12·64
Stirling,	39,630	41,620	46,291	13·43	14·38	15·61
Sutherland,	6,212	6,154	5,960	16·27	15·83	15·46
Wigtown,	7,016	8,347	9,367	7·98	9·18	10·37
Total,	1,134,242	1,224,112	1,313,584	10·77	11·52	12·36

The rates of assessment in the several districts varied considerably for the year to 15th May, 1907.

There was no assessment on occupiers in the case of the three following Boards, the rates given in the Appendix being those on Owners only, viz.:—Auchterless (Aberdeen), 2¼d.; Evie, &c. (Orkney), 4¼d.; Kirkwall (L) (Orkney), 4d.—the sum received as Agricultural Grant being apparently sufficient to relieve the occupier of any assessment during the year.

The rates in other districts varied from one penny to 3s. 9d. per £.

For example, in Barvas (Ross) it was 1d.; in Dumbarton (L) (Dumbarton) it was 1½d.; in Glengairn (Aberdeen) and Abdie (Fife) it was 2d.; in Aberdalgie (Perth) it was 2⅛d.; in Tweedsmuir (Peebles) it was 2⅕d.; in Temple (Edinburgh), Portmoak (Kinross), Perth East (L) (Perth), and Linton (Roxburgh) it was 2⅓d.; in Foulden (Berwick) and Dron (Perth) it was 2⅖d.; in Bourtie (Aberdeen), Kilbucho, &c. (Peebles), and Fowlis Wester and Methven (Perth) it was 2¾d.;

in Cupar (L) (Fife) it was $2\frac{7}{10}$d.; in Old Machar (Aberdeen), Longformacus (Berwick), Tinwald (Dumfries), Kingsbarns (Fife), Aberlady (Haddington), Abernethy, &c., and Kirkhill (Inverness), and Dalmeny, &c. (Linlithgow), it was 3d.; in St. Quivox, &c. (Ayr), Bunkle, &c. (Berwick), and Carrington (Edinburgh) it was $3\frac{1}{8}$d.; in Ashkirk (Selkirk) it was $3\frac{1}{4}$d.; in Traquair (Peebles) it was $3\frac{3}{8}$d.; in North Bute (Bute), Airlie (Forfar), Yester (Haddington), Moy, &c. (Inverness), Arbuthnott (Kincardine), Wandell (Lanark), Bendochy, Gartmore, and Trinity Gask (Perth), and Jedburgh (L) (Roxburgh) it was $3\frac{1}{2}$d.; in Crathie, &c. (Aberdeen) it was $3\frac{9}{16}$; in Montrose (L) (Forfar) it was $3\frac{11}{16}$; in Garvock (Kincardine), Crawford (Lanark), Cargill and Madderty (Perth), and Roberton (Roxburgh) it was $3\frac{3}{4}$d.; in Fenwick (Ayr), Mertoun (Berwick), and Elie (Fife) it was $3\frac{4}{5}$d.; in Saline (Fife) and Killearn (Stirling) it was $3\frac{9}{10}$; while in Belhelvie, Keig, Peterhead (L), Tough, and Turriff (Aberdeen), South Knapdale (Argyll), Kilwinning and Tarbolton (Ayr), Inveravon (Banff), Keiss (Caithness), Kirkpatrick-Fleming (Dumfries), Penicuik (Edinburgh), Barry, Kirriemuir, and Ruthven (Forfar), Troqueer and Urr (Kirkcudbright), Calderhead, Clarkston, and New Monkland (Lanark), Ardclach, Auldearn, and Cawdor (Nairn), Kirkwall (B) (Orkney), Persie (Perth), Killearnan and Logie Easter (Ross), Fetlar (Shetland), Airth and Kippen (Stirling), and Kildonan (Sutherland) it was 1s.; and it was 2s. or over in the following, viz.:—Walls, &c. (Shetland), Falkirk (B) (Stirling), and Eddrachillis (Sutherland), 2s.; Lochgelly (Fife), 2s. $0\frac{1}{2}$d.; Harris (Inverness), Hamilton (B) (Lanark), Hoy, &c. (Orkney), and Falkirk (L) (Stirling), 2s. 1d.; Cairney (Aberdeen), 2s. $1\frac{1}{5}$d.; Sleat (Inverness), 2s. $1\frac{1}{2}$d.; Bracadale (Inverness), 2s. $1\frac{4}{5}$d.; Tyree (Argyll), 2s. 2d.; Kilmuir (Inverness), 2s. $2\frac{1}{2}$d.; Tongue (Sutherland), 2s. 4d.; Larbert (Stirling), 2s. $4\frac{3}{10}$d.; North Uist (Inverness) and Uig (Ross), 2s. 5d.; Durness (Sutherland), 2s. $6\frac{1}{2}$d.; Duirinish (Inverness), 2s. 11d.; and Barra (Inverness), 3s. 9d.

The School Rate in the eight principal towns was as follows, viz.:—Edinburgh, 1s. $0\frac{3}{16}$d.; Glasgow, 1s. 4d.; Dundee, 1s. 2d.; Aberdeen, 1s. 5d.; Leith, 1s. $5\frac{3}{4}$d.; and Perth, 1s. 2d.; while in Greenock and Paisley there was a classification of rates on occupiers.

The following Tables give (1) the number of School Boards in the several counties which paid rates varying from 1d. to 2s. and above, (2) the number of burghs and parishes which paid rates from less than 3d. in the £ to 2s. and upwards, and (3) the number which paid rates of 6d. and upwards, and less than 6d. in the £, and the percentage which each class bears to the whole number:—

County.	Of 2s. and above.	Of 1s. and below 2s.	Of 9d. and below 1s.	Of 6d. and below 9d.	Of 3d. and below 6d.	Below 3d.	Classification.	Number of Boards.
Aberdeen, . .	1	26	34	18	8	3	2	92
Argyll, . .	1	21	10	11	1	0	2	46
Ayr, . . .	0	15	14	13	4	0	5	51
Banff, . . .	0	9	8	7	1	0	0	25
Berwick, . .	0	6	9	8	8	1	0	32
Bute, . . .	0	2	1	1	2	0	0	6
Caithness, . .	0	11	0	1	0	0	0	12
Clackmannan, .	0	4	1	0	0	0	1	6
Dumbarton, . .	0	4	3	4	0	1	2	14
Dumfries, . .	0	8	11	16	10	0	0	45
Edinburgh, . .	0	9	4	8	6	1	2	30
Elgin, . . .	0	10	7	1	1	0	2	21
Fife, . . .	1	13	16	17	11	2	9	69
Forfar, . . .	0	13	10	18	16	0	3	60
Haddington, .	0	1	3	8	7	0	6	25
Inverness, . .	7	12	6	5	6	0	1	37
Kincardine, . .	0	3	3	8	2	0	3	19
Kinross, . .	0	0	1	1	1	1	2	6
Kirkcudbright, .	0	4	6	13	6	0	1	30
Lanark, . .	1	27	7	10	2	0	3	50
Linlithgow, . .	0	7	1	1	3	0	0	12
Nairn, . . .	0	3	1	0	1	0	0	5
Orkney, . . .	1	7	5	2	5	0	0	20
Peebles, . .	0	3	1	4	4	2	0	14
Perth, . . .	0	10	19	24	15	5	5	78
Renfrew, . .	0	7	4	1	0	0	10	22
Ross and Cromarty	1	18	5	8	2	1	0	35
Roxburgh, . .	0	5	8	10	8	1	0	32
Selkirk, . .	0	1	2	3	3	0	0	9
Shetland, . .	1	8	2	1	0	0	0	12
Stirling, . .	3	11	3	2	3	2	0	24
Sutherland, . .	3	7	1	2	0	0	0	13
Wigtown, . .	0	4	10	4	0	0	0	18
	20	289	216	230	136	20	59	970

Equivalent to a Rate of Assessment per £	BURGHS.						PARISHES.					
	Numbers.			Percentage.			Numbers.			Percentage.		
	1905.	1906.	1907.	1905.	1906.	1907.	1905.	1906.	1907.	1905.	1906.	1907.
Of 2s. and above, . . .	...	1	2	...	2·1	4·1	11	15	18	1·3	1·7	2·1
Of 1s. and below 2s., . . .	30	32	35	63·8	66·7	71·4	170	197	254	19·9	23·1	29·5
Of 9d. and below 1s., . . .	11	10	10	23·4	20·8	20·4	229	213	206	26·8	25·0	23·9
Of 6d. and below 9d., . . .	6	2	2	12·8	4·2	4·1	248	250	228	29·1	29·3	26·4
Of 3d. and below 6d., . . .	...	3	...	...	6 2	...	148	144	136	17·3	16·9	15·8
Of 1d. and below 3d., . . .	...	...	...	...	...	...	48	34	20	5·6	4·0	2·3
	47	48	49	...	...	...	854	853	862	...	...	...
Classification,	8	7	6	...	...	...	61	62	53	...	...	...
Total, . . .	55	55	55	...	...	...	915	915	915	...	...	...

Equivalent to a Rate of Assessment per £	Number.			Per cent.		
	1905.	1906.	1907.	1905.	1906.	1907.
Of 6d. and above.						
Burghs, ...	47	45	49	100	93·7	100
Parishes, ...	658	675	706	77	79·1	81·9
Total, .	705	720	755	78·2	79·9	82·9
Below 6d.						
Burghs, ...	...	3	...	...	6·3	...
Parishes, ...	196	178	156	23	20·9	18·1
Total, .	196	181	156	21·8	20·1	17·1

Loans.—The total amount entered in the Accounts as having been borrowed by School Boards up to Whitsunday 1907 was £9,797,169, 0s. 1d., of which £396,306, 11s. 7d. was received during the year 1906–07. Of the latter sum, £161,218, 11s. 7d. was lent to 20 Burgh Boards, and £235,088 to 99 Landward Boards.

Of the total amount borrowed up to Whitsunday 1907, the sum of £3,904,354, 3s. 9d. appears in the Accounts as having been repaid by that date.

Endowments.—The sum received from this source during the year, as appearing from the Accounts, was £9,573, 14s. 1d., as compared with £9,701, 19s. of the previous year. The amounts received by School Boards from Town Councils out of the Common Good of Burghs and the amounts received direct by teachers from the Dick and Milne Bequests are all included under this head. In addition to the above amount, there was received for Higher Class Public Schools a sum of £4,073, 6s. 1d. from Town Councils, and a sum of £2,714, 6s. 1d. from other Endowments.

I append a Table showing the payments for the year by Town Councils from the Common Good of Burghs or other Funds under Section 46.

The Income from other Sources amounts to £56,176, 2s. 11d., details of which are as follows, viz.:—

From the Sale of old Buildings, &c., . . .	£4,405	15	9
„ Voluntary Contributions, ...	13,946	5	9
„ Rents, ...	4,105	17	5
„ Payments for Fuel and Light, &c., . .	137	13	5
„ Grants under Highland Schools Act, . .	911	0	0
„ Grants from Department under Minute of 4th March 1895, &c., ...	1,500	0	0
„ Grants from Department under General Aid Grant Minutes, ...	21,950	0	0
„ Payments under Boundary Commissioners' awards, ...	872	6	4
„ Fines recovered, ...	513	19	6
„ Interest on Bank Deposits, . . .	2,850	0	5
„ Miscellaneous, ...	4,983	4	4
	£56,176	2	11

Expenditure.

The total Expenditure, as appearing from the Accounts, was £3,274,906, 9s. 9d., the particulars of which are as undernoted:—

Elections,	£2,807	0	10
Salaries of Officers,	78,868	11	0
Do. of Teachers,	1,795,495	16	9
Purchase of Land and Erection, &c., of Buildings,	408,717	3	4
Printing, Postages, &c.,	18,409	1	9
Books, Apparatus, and Stationery,	91,829	17	9
Rents, Rates, &c.,	99,696	4	10
Furniture, Repairs, &c.,	103,757	13	7
Fuel, Light, and Cleaning,	151,129	0	10
Contributions under Section 42,	9,665	1	0
Interest on Loans,	198,714	13	4
Repayment of Loans,	244,040	4	1
Legal Expenses and Expenses of Prosecuting Defaulting Parents,	3,480	5	5
Payments towards Maintenance of Higher Class Schools,	14,418	17	4
Other Expenses,	53,876	17	11
	£3,274,906	9	9

This amount shows an increase of £119,491, 16s. 1d. on the Expenditure for 1905–06; or, deducting Erections in each case, an increase of £100,563, 14s.

Salaries of Officers.—The expenditure under this head amounts to £78,868, 11s., being an increase of £2,154, 16s. on the sum paid during the previous year.

Salaries of Teachers.—The total of this head, which includes Retiring Allowances to Teachers, amounts to £1,795,495, 16s. 9d., an increase of £64,944, 17s. 11d. on the amount shown in the last Report. In addition to the above, there are several instances where the salaries of teachers in connection with Technical Classes, &c., have been included by Treasurers under the heading for Miscellaneous Expenditure.

The proportion applicable to Retiring Allowances to Teachers would appear to be £19,367, 5s. 11d., according to returns made to this office in terms of a special Circular issued by the Department on the subject. The above returns also show that a further sum of £2,855 was paid as Retiring Allowances to Teachers of Higher Class Public Schools.

Purchase of Land, and Erection, Enlargement, or Alteration of School Buildings.—The amount under this head is £408,717, 3s. 4d., which, added to the sum expended during the thirty-three previous years—viz., £10,554,065, 8s. 11d.—gives a total of £10,962,782, 12s. 3d.

Office Expenses, Books, Rents, &c., Furniture and Repairs, Fuel, &c.—The expenditure for the year under the above heads amounted to £464,821, 18s. 9d., of which £26,919, 16s. 2d. was expended for the Board, and £437,902, 2s. 7d. for the schools.

Legal Expenses and Expenses of Prosecution of Defaulting Parents.—The total under this head amounts to £3,480, 5s. 5d., of which £2,636, 14s. 5d. appears to have been spent on prosecutions of defaulting parents, £61, 6s. 3d. on litigation, and £782, 4s. 9d. in connection with erection of buildings, sales of old buildings, &c.

Payments in connection with Higher Class Schools. — The following Table shows the amounts which were expended out of the rates during the year for the maintenance of the 29 Higher Class Public Schools, and for Interest and Repayment of Loans in connection with these schools:—

Higher Class Schools.	Maintenance.	Interest and Repayment of Loans.
	£ s. d.	£ s. d.
Aberdeen,	2,210 7 10	2,240 11 2
Arbroath,	179 10 0	676 12 11
Ayr,	273 12 0	379 9 8
Brechin,	191 1 10	188 18 2
Callander,	...	124 11 8
Dumfries,	...	803 7 6
Dunfermline,	100 0 0	...
Duns,	...	...
Edinburgh,	2,596 17 7	614 1 10
Elgin,	295 0 7	171 5 9
Falkirk,	...	702 15 7
Forfar,	0 15 3	153 15 0
Galashiels,	68 10 5	22 6 11
Glasgow,	4,180 10 1	3,727 17 0
Greenock,	650 15 6	395 3 3
Haddington,	187 15 11	127 11 6
Hamilton,	287 5 10	49 15 10
Hawick,	...	...
Irvine,	2 2 4	705 14 9
Kelso,	...	90 17 4
Kirkcaldy,	1,094 15 1	...
Kirkcudbright,	39 13 2	13 15 9
Linlithgow,	...	451 5 0
Montrose,	58 15 5	476 10 9
North Berwick,	157 3 9	260 5 3
Paisley,	679 4 8	814 7 2
Peebles,	65 0 0	270 9 7
Perth,	766 15 3	637 15 8
Stirling,	333 4 10	122 16 2
	14,418 17 4	14,222 1 2

Other Expenses.—These amount to £53,876, 17s. 11d., of which £15,798, 9s. 11d. was for interest on bank accounts, and £1,457, 17s. 6d. was incurred in procuring loans. The balance under this head includes the payments under Boundary awards, charges in connection with engaging teachers, travelling, &c.

The Expenditure, as detailed above, may be divided into six headings, viz.:—(1) Administration, (2) Maintenance of Schools, (3) Capital Charges for Works of a permanent character, (4) Repayment of Loans contracted for Capital Charges, (5) Interest on Loans, (6) Miscellaneous; and the proportion which each bears to the total expenditure is shown by the following Table:—

	£	Per cent.
Administration,	112,076	= 3·42
Maintenance of Schools,	2,257,482	= 68·93
Capital charges for works of a permanent character,	408,717	= 12·48
Repayment of Loans,	244,040	= 7·45
Interest on Loans,	198,715	= 6·07
Miscellaneous (including interest on Bank Accounts),	53,876	= 1·65

If the expenditure met by Loans, viz., capital charges, were omitted, the comparison upon the ordinary current expenditure would stand thus:—

	£	Per cent.
Administration,	112,076	= 3·91
Maintenance of Schools,	2,257,482	= 78·76
Repayment of Loans,	244,040	= 8·52
Interest on Loans,	198,715	= 6·93
Miscellaneous (including interest on Bank Accounts),	53,876	= 1·88

It thus appears that 3·91 per cent. of the current expenditure, including the cost of enforcing attendance at school, is incurred in carrying out the provisions of the Education Acts; 15·45 per cent. in providing school accommodation; and 78·76 per cent. in instructing the children.

The sum set down in these Tables under the head of "Repayment of Loans" represents the portion of the money expended on works of a permanent character chargeable on the rates of the year; and the amount included under "Interest on Loans" is the annual charge on the ratepayers for the privilege of spreading the cost of works of a permanent character over a series of years, in place of defraying it out of rates when it is incurred.

The total Expenditure for the year, viz., £3,274,906, 9s. 9d., was met by:—

	£	Per cent.
Rates,	1,197,256	= 36·56
Grants, School Fees, &c.,	1,681,344	= 51·34
Loans,	396,306	= 12·10

The expenditure on the maintenance of schools, viz., £2,257,482, may be said to be defrayed from the following sources:—

	£	Per cent
Rates,	625,393	= 27·70
Grants,	1,190,066	= 52·72
Fees, Books sold to Children, Grants in Relief of Fees, &c.,	415,968	= 18·43
Other Sources of School Income,	26,055	= 1·15

Liabilities.

The Liabilities at Whitsunday 1907 (exclusive of loans outstanding) amounted to £125,520, 14s.

The items are as follows, viz.:—

Interim Overdrawn Balances, ...	£119,995 7 3
Unpaid Accounts, ...	4,808 1 2
Salaries of Teachers, ...	675 10 7
Do. of Officers, ...	41 15 0
	£125,520 14 0

I have again, in the course of my examination of the Accounts, in cases where the bank accounts of School Boards have been found to be temporarily overdrawn, communicated with the Treasurers, calling the attention of the Board to this matter, and requesting that steps should be taken, at once, either to have the overdraft paid or arrangements made to materially reduce it, in order that the rates might be relieved of the burden of bank interest.

At 15th May 1907 the Balances stood thus:—

Balances in hand, as per Abstract, . . .	198,267 14 1
Balances Overdrawn, as per Abstract, . .	£119,995 7 3
	£78,272 6 10

I find the Liabilities of School Boards in respect of loans outstanding (including loans secured over Board Offices) were:—

At 15th May 1905.	At 15th May 1906.	At 15th May 1907.
£	£	£
5,664,707	5,748,423	5,899,509

Technical Education.—The grants appearing under Income are £8,055, 18s. 6d. I find that the grants were expended on the salaries of teachers under the Continuation Class Code, on fees to teachers and others of special classes taught, such as Cookery, Agriculture, Laundry-work, Dairy-work, the supply of apparatus in connection with the subjects taught, and expenses connected with the carrying on of the separate classes. In some cases the grants received had not been expended, and were carried forward in the Boards' Accounts, and will be available to meet expenditure on Technical Education during the year 1907–08; while in other cases a portion of the grant still remained unexpended as at the date of closing the Accounts for the year, and these balances will fall also to be dealt with in like manner.

Secondary Education.—The amount of £27,272, 14s. 6d., entered under Income, was received towards aiding Secondary Education. This sum was chiefly made up of amounts received in aid of higher departments in grant-earning schools, and of capitation

grants and bursaries. Where necessary an enquiry was made from this office, in the course of the examination of the Accounts, regarding the amount expended by the Board during the year in connection with Secondary Education, and also as to the nature of the expenditure, and whether separate accounts were kept of such expenditure. I find that the grants were expended on the salaries of teachers, the supply of books, &c., applicable to the higher subjects, railway fares of scholars, and bursaries. Some of the grants received had not been expended, partly occasioned by the grants not having been received till a late period of the financial year, and in such cases the amounts unexpended will be available to meet expenditure on Secondary Education during the year 1907–08.

I append a Summary of the Abstract, showing the total amount of Income, Expenditure, and Liabilities in each county as returned in the Accounts.

I also submit, appended hereto, an Abstract of the Accounts of the Higher Class Public Schools for the year ending 15th May 1907.

The number of these schools is 29, the same as in the previous Report.

Their total Income during the year was £139,199, 10s. 7d. and their total Expenditure amounted to £129,676, 6s. 3d.

I have been unable to pass certain entries in the Accounts of the undernoted Boards, and have placed a special docquet on the several Accounts accordingly, viz. :—

Dunoon, &c. (Argyll), fee to Examiner for "Hunter Prize," and charged against the School Fund, ...	£3	3	0
Kilbirnie (Ayr), portion of a fee of £1, 1s., charged by Clerk of Parish Council for Certificate in connection with the Board's Claim under Section 67, . . .	0	10	6
Kilmarnock (B.) (Ayr), portion of a fee of £1, 1s., charged by the Inspector of Poor for Certificate in connection with the Board's Claim under Section 67, . . .	0	10	6
Thurso (Caithness), balance due by the late Treasurer, which was written off by the Board as irrecoverable, . . .	8	3	6
Dumbarton (B.) (Dumbarton), portion of a fee of £1, 1s., charged by Inspector of Poor for Certificate in connection with the Board's Claim for Additional Grant, 10s. 6d.; and subscriptions to the Scottish School Boards Association, £1, 0s. 6d., . . .	1	11	0
Old Kilpatrick (Dumbarton), portion of a fee of £2, 2s., charged by Inspector of Poor for Certificate in connection with the Board's Claim under Section 67, . . .	1	1	0

Edinburgh (City) (Edinburgh), subscription for delegates to the National Conference on Infantile Mortality held in London, £1, 1s.; expenses other than travelling expenses of delegate to Conference on Infantile Mortality held in Bradford, £4, 4s.; and expenses of luncheons to Members of School Boards attending Conferences in Edinburgh in February and April 1907, £17, 17s. 3d.,	£23	2	3
Dunfermline (B.) (Fife), portion of a fee of £1, 1s., charged by Clerk of the Parish Council in connection with Board's Claim under Section 67,	0	10	6
Portree (Inverness), expenses of repairing foot-bridges,	1	2	6
Clarkston (Lanark), portion of a fee of £2, 2s., charged by Inspector of Poor in connection with Board's Claim under Section 67,	1	1	0
Glasgow (B.) (Lanark), retiring allowance to a former teacher under the Board who had accepted the Superannuation Act, £40; and expenses other than actual travelling expenses of delegate to Conference in London on the Systematic Teaching on Hygiene and Temperance in Schools, £3, 3s.,	43	3	0
Rutherglen (Lanark), expenses of the Clerk and four Members of the Board to London in connection with the recognition of Stonelaw Higher Grade Public School as a centre for the training of junior students,	51	3	9
Bo'ness (Linlithgow), payments for books and prizes for children attending schools not under the Board's own management,	25	18	0
Paisley (B.) (Renfrew), honorarium to the Clerk of the Board for special services in connection with the preparation of an analysis of the voting at the last Triennial Election,	10	10	0
Buchanan (Stirling), for board of children,	3	8	11
Falkirk (B.) (Stirling), portion of a fee of £1, 1s., charged by Inspector of Poor for Certificates, 10s. 6d.; and entrance fee and subscription for the Scottish School Boards Association, 15s.,	1	5	6

		£	s.	d.
Aberdeen (B.) (Aberdeen),	Subscriptions to the Scottish School Board Association, or expenses to meetings of the same, or to other meetings or conferences in connection with Educational matters.	7	14	6
Riccarton (Ayr),		0	12	7
Alloa (B.) (Clackmannan),		3	8	0
New Kilpatrick (Dumbarton),		0	12	6
Cramond (Edinburgh),		0	12	6
Leith (B.) (Edinburgh),		6	15	6
Kirkcaldy (B.) (Fife),		3	3	0
St. Andrews (B.) (Fife),		0	12	6
Montrose (B.) (Forfar),		1	6	7
Fetteresso, &c. (Kincardine),		0	12	6
Cadder (Lanark),		0	7	6
Dalziel (Lanark),		0	10	0
Maryhill (Lanark),		1	15	0
Nairn (B.) (Nairn),		0	12	6
Crieff (Perth),		3	3	0
Kilmacolm (Renfrew),		0	12	6
Neilston (Renfrew),		0	10	0
Galashiels (Selkirk),		5	10	0

I have the honour to be,

SIR,

Your most obedient Servant,

DAVID F. OCHTERLONY,

Accountant.

ABSTRACTS

SCHOOL BOARDS' . . . .

II. General Abstract of Statements of Income, Expenditure, and

(Published under Section 51 of the

INCOME.

(B.) Burgh.

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
ABERDEEN.								
Aberdeen (B.)	...	3,906 18 10	14,641 0 0	32,516 17 1	5,523 6 0	4,535 8 1	5,109 5 8	...
Aberdour	2 16 3	...	138 0 0	267 11 0	51 15 0	...	30 10 4	...
Aboyne and Glentanner	...	...	165 0 0	359 12 6	61 17 6	10 2 3	...	...
Alford	202 15 0	...	171 0 0	334 13 6	104 2 6	...	...	...
Ardallie	9 1 3	...	77 8 0	168 14 0	109 0 6	...	...	...
Auchindoir and Kearn	...	...	103 4 0	215 12 0	68 14 0	...	23 4 6	...
Auchterless	182 2 10	...	137 8 0	275 4 7	91 10 6	...	...	...
Bellhelvie	60 17 0	...	180 12 0	361 10 6	67 14 6	4 12 8	...	...
Birse	76 17 0	...	94 4 0	189 0 7	35 6 6	...	...	...
Bourtie	2 0 11	...	13 4 0	38 8 6	6 6 0	...	...	...
Cairney	...	...	135 0 0	288 1 3	240 12 6	...	...	...
Chapel-of-Garioch	110 0 10	...	107 12 0	212 14 3	140 10 6	...	...	...
Clatt	...	...	36 0 0	75 17 9	53 10 0	6 14 7	...	...
Cluny	106 11 0	...	36 12 0	68 4 9	63 14 6	...	...	...
Coull	20 11 0	...	31 4 0	72 13 3	51 14 0	...	...	...
Crathie and Braemar	24 5 9	...	70 4 0	175 8 6	126 6 6	6 13 10	...	...
Crimond	25 2 2	...	89 8 0	214 2 6	34 17 6	...	...	...
Cruden	...	...	340 4 0	656 9 0	187 11 6	...	104 4 10	...
Culsalmond	...	...	42 0 0	159 12 9	15 19 6	...	...	...
Daviot	...	...	63 0 0	126 17 6	63 12 6	...	...	...
Drumblade	...	...	64 16 0	137 16 6	64 6 0	19 12 9	...	5 0 0
Drumoak	56 12 2	...	88 4 0	184 5 9	113 1 6	...	...	...
Dyce	...	...	137 8 0	296 6 10	91 10 6	11 16 11	...	5 0 0
Echt	...	...	116 8 0	265 2 6	43 13 0	...	...	...
Eilon	...	8 1 10	390 12 0	914 5 6	266 9 6	44 4 7	94 9 11	...
Fintray	43 15 3	...	72 12 0	151 19 0	107 4 6	...	...	...
Forgue	12 10 7	...	113 8 0	240 19 6	122 10 6	8 17 1	...	5 0 0
Foveran	...	...	207 0 0	298 0 9	80 11 0	...	...	...
Fraserburgh	82 12 7	29 6 7	922 4 0	1,819 9 9	345 16 6	89 12 6	158 19 6	32 0 0
Fyvie	...	...	265 4 0	433 11 7	209 9 0	...	...	...
Gartly	...	...	53 8 0	249 2 6	20 9 6	...	...	...
Glass	8 19 2	...	71 8 0	171 0 6	63 2 6	...	...	...
Glenbucket	...	...	43 4 0	108 10 0	16 4 0	10 2 5	...	...
Glengairn	84 11 9	1 9 4	10 16 0	...	4 1 0	...	...	...
Glenmuick and Tullich	60 11 6	...	201 12 0	441 2 0	75 12 0	...	...	...
Huntly	...	4 10 0	520 4 0	1,216 12 6	275 1 6	38 8 5	474 11 5	16 5 0
Insch	68 1 0	...	198 12 0	436 16 3	117 3 6	22 6 4	53 3 8	9 10 0
Inverurie	40 15 7	31 7 0	432 8 0	1,028 0 4	180 18 0	204 3 5	177 14 7	...
Keig	...	...	57 12 0	124 17 9	61 12 0	...	41 3 8	...
Keithhall and Kinkell	62 2 3	...	63 12 0	111 7 6	63 17 0	...	...	...
Kemnay	973 18 1	...	238 16 0	519 6 6	89 11 0	...	100 3 9	...

ACCOUNTS.

LIABILITIES of SCHOOL BOARDS for the Year ended the 15th May 1907.

Education (Scotland) Act, 1872.)

INCOME.

(L.) Landward.

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
75 0 0	53,107 0 0	1/5	2,218 11 7	...	...	*936 19 1	122,570 6 4	24,781 10 8	762,920
...	292 18 2	9	...	25 0 11	...	1 4 5	809 16 1	16 9 7	6,602
4 0 0	373 0 9	6⅔	...	20 8 7	...	...	994 1 7	276 14 1	14,013
...	344 18 0	10	...	40 14 1	...	21 12 6	1,219 15 7	...	8,955
...	264 12 10	10⅔	...	22 1 2	...	0 5 0	651 2 9	...	6,393
...	336 0 0	1/2¼	...	21 15 9	...	...	768 10 3	...	6,465
...	215 17 0	†	...	21 4 11	...	...	923 7 10	...	10,530
...	538 1 4	1/	...	22 1 2	...	...	1,235 9 2	...	11,828
...	286 2 6	8⅔	...	46 17 8	...	3 10 0	731 18 3	...	8,183
...	66 14 8	2¾	...	...	...	...	126 14 1	5 14 8	4,422
...	580 0 0	2/1⅛	...	25 17 3	...	‡130 18 10	1,400 9 10	68 13 0	6,543
...	556 12 1	1/3⅔	...	26 8 1	...	...	1,153 17 9	70 11 5	9,747
...	86 0 0	6	...	...	...	...	258 2 4	45 2 8	3,322
...	139 15 7	4⅛	...	43 18 11	...	...	463 16 9	...	6 085
...	67 15 8	5¾	...	20 19 6	...	0 19 8	265 17 1	...	2,343
...	352 10 2	3⅙	...	23 2 11	...	§45 0 0	823 11 8	18 3 5	23,254
20 0 0	200 0 0	10	...	26 8 1	...	4 19 8	614 17 11	5 15 6	5,148
...	876 18 3	11⅔	...	...	21 0 0	11 4 5	2,197 12 0	...	17,225
...	175 0 0	9	...	20 3 2	...	1 8 0	414 3 5	...	4,907
...	241 10 0	1/2	500 0 0	24 10 1	...	...	1,019 10 1	...	5,420
...	220 0 0	9⅓	...	25 17 3	...	2 7 9	539 16 3	...	6,492
...	200 0 0	5⅚	...	23 19 2	...	...	666 2 7	...	7,452
...	405 18 8	11¾	...	...	...	3 11 0	951 11 11	51 19 3	8,206
...	264 1 5	9	...	45 0 11	...	0 10 0	734 15 10	11 6 11	6,543
50 0 0	1,190 9 6	‖	...	34 0 2	...	0 15 6	2,993 8 6	...	19,776
...	250 9 0	10⅛	...	21 4 11	...	2 3 9	649 8 5	...	6,444
...	236 0 0	7	...	22 1 2	...	2 5 3	763 12 1	...	7 544
...	510 0 0	10	342 0 0	28 0 8	...	9 10 4	1,475 2 9	373 11 3	12,152
200 0 0	1,800 0 0	10¼	...	34 0 2	...	1 10 0	5,515 11 7	542 8 6	45,358
...	649 8 1	8½	...	77 12 8	...	5 5 0	1,640 10 4	240 19 4	18,117
...	345 0 0	1/3⅘	...	24 4 8	...	0 6 9	692 11 5	...	5,848
...	200 0 0	10½	...	24 15 0	11 0 0	4 6 10	559 12 0	15 5 0	4,566
...	120 0 0	1/1½	...	19 6 11	15 18 5	...	333 5 9	29 12 7	2,147
...	47 10 2	2	...	...	...	...	148 8 3	...	4,513
15 0 0	502 7 4	5⅓	250 0 0	...	...	24 10 9	1,370 15 7	...	20,880
200 0 0	1,213 12 3	1/6⅗	...	108 3 2	...	19 11 2	4,086 19 5	...	17,109
40 0 0	280 9 0	9⅓	...	35 8 2	36 5 0	...	1,297 5 11	...	8,214
50 0 0	886 17 6	1/1	...	34 0 2	...	¶62 14 11	3,178 19 6	...	17,109
...	230 0 0	1/-	...	24 4 8	...	7 10 0	547 0 1	111 4 4	4,168
...	113 17 11	3¼	...	20 0 0	...	7 1 1	441 17 9	...	6,836
60 0 0	249 16 0	9	1,060 0 0	30 9 6	...	19 11 7	3,341 12 5	426 2 4	6,905

* Rents. £519 12s. 11d.
§ H.M. Donation.
† Owners, 2½d.; no Rate on Occupiers.
‖ Owners, 7½d.; Occupiers, 9¾d., 3¾d., 6½d.
‡ Price of Property sold. £122 10s.
¶ Rents £37 10s. 6d

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
ABERDEEN—*contd.*								
Kennethmont	...	...	96 0 0	216 8 9	36 0 0	...	...	...
Kildrummy	...	...	44 8 0	99 12 0	16 13 0	...	...	...
Kincardine O'Neil	...	...	220 16 0	476 16 6	162 16 0	...	...	...
King Edward	31 6 11	...	78 0 0	172 2 6	119 5 0	10 5 10	...	3 0 0
Kinnmonth	38 0 7	0 5 0	94 4 0	183 17 3	115 6 6	5 3 3	27 4 9	2 15 0
Kinnellar	22 8 7	...	36 0 0	70 8 0	13 10 0	...	...	...
Kintore (including B.)	116 15 11	...	279 0 0	587 1 1	154 12 6	...	78 13 10	...
Leochel-Cushnie	129 5 9	...	88 16 0	181 15 6	83 6 0	...	...	...
Cairncoullie (Comb.)	...	...	30 12 0	70 5 9	51 9 6	...	...	...
Craigievar (Comb.)	...	...	41 8 0	82 16 3	15 10 6	...	...	...
Leslie	...	...	49 16 0	96 4 9	18 13 6	...	...	...
Logie-Buchan	95 16 9	...	84 12 0	172 19 0	71 14 6	7 10 8	16 0 5	...
Logie-Coldstone	73 9 1	...	71 8 0	155 9 9	26 15 6	...	...	...
Longside	318 17 2	...	295 4 0	593 3 0	225 13 0	...	...	...
Lonmay	...	7 3 5	202 4 0	442 7 6	145 16 6	11 12 2	161 15 2	3 15 0
Lumphanan	...	...	72 0 0	145 4 0	27 0 0	...	...	...
Meldrum	41 13 0	...	196 16 0	377 5 9	73 16 0	...	1 15 7	...
Methlick	...	...	177 12 0	406 4 0	105 18 6	...	...	...
Midmar	83 16 2	...	76 16 0	157 4 6	28 16 0	...	...	...
Millbrex	...	...	37 16 0	75 4 9	14 3 6	...	...	...
Montquhitter	85 10 10	...	211 4 0	446 19 9	79 4 0	...	71 15 2	...
Monymusk	19 0 9	4 1 0	121 16 0	242 14 9	90 0 0	...	...	...
New Byth	...	7 9 11	198 0 0	402 8 2	104 5 0	9 18 0	39 10 1	...
New Deer	394 9 9	...	325 8 0	727 11 6	255 15 6	...	113 7 4	...
Newhills	...	13 19 6	572 8 0	1,176 17 4	254 13 0	57 13 2	111 12 2	17 1 6
New Machar	56 11 6	0 7 6	162 0 0	321 19 9	140 15 0	..	...	...
New Pitsligo	102 0 3	...	146 8 0	324 0 6	54 13 6	...	1 19 8	...
Old Deer	...	6 15 0	305 8 0	603 11 9	302 5 6	...	...	...
Maud (Comb.)	...	...	121 4 0	247 8 0	45 18 0	...	...	...
Old Machar	60 1 2	17 19 8	114 16 0	419 2 9	279 5 6	...	...	...
Oyne	20 2 8	...	57 12 0	123 6 6	62 10 0	...	...	...
Peterculter	112 13 0	14 13 0	409 4 0	845 14 9	193 9 0	109 1 11	...	46 10 0
Peterhead (B.)	...	408 10 0	1,325 8 0	3,236 16 7	527 0 6	301 19 7	692 12 0	86 14 6
Peterhead (L.)	663 11 0	...	348 12 0	692 8 2	200 14 6	...	108 6 6	...
Pitsligo	...	...	313 4 0	613 1 3	157 9 0	...	145 17 11	...
Premnay	52 3 0	...	54 0 0	119 0 9	60 5 0	...	...	...
Rathen	...	1 10 0	274 16 0	571 18 9	173 1 0	...	82 3 6	...
Rayne	64 6 1	...	114 0 0	230 1 9	112 15 0	...	...	...
Rhynie	...	16 4 0	138 0 0	217 1 0	173 6 6	...	20 13 11	...
St Fergus	...	...	103 16 0	202 15 3	78 18 6	...	...	...
Savoch	36 19 3	...	112 16 0	222 3 0	122 6 0	...	...	...
Skene	99 16 6	...	167 8 0	350 2 6	182 15 6	...	...	...
Slains	79 19 7	...	56 16 0	124 8 6	60 14 0	...	...	...
Strathdon	109 11 1	...	84 0 0	230 2 6	31 10 0	10 3 6	...	...
Strichen	70 2 2	2 0 0	190 16 0	420 5 9	71 11 0	4 16 3	...	5 0 0
Tarland	...	...	85 16 0	167 14 9	32 3 6	...	...	...
Tarves	86 3 2	...	227 8 0	449 13 10	115 5 6	...	...	...
Tough	...	...	69 12 0	145 14 6	26 2 0	...	...	...
Towie	...	1 0 8	65 8 0	160 0 6	64 10 6	...	...	...
Tullynessle and Forbes	138 8 5	...	67 4 0	134 15 3	25 4 0	...	...	...
Turriff	...	9 3 11	499 16 0	1,180 15 7	227 8 6	21 11 7	146 2 10	8 0 0
Tyrie	2 11 10	0 18 0	41 8 0	79 13 6	63 5 6	...	...	...
Udny	44 9 5	...	123 0 0	248 18 0	86 2 6	...	...	...
Ythan Wells	...	...	82 4 0	167 14 0	110 16 6	...	...	...
Total of Aberdeen	5,567 12 3	4,493 14 2	30,565 16 0	66,535 11 0	15,588 1 0	5,562 11 9	8,187 2 8	239 11 0

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	320 0 0	1/1⅞	...	29 18 8	...	0 5 0	698 12 5	...	5,842
...	171 17 7	11¼/₁₆	...	26 2 8	...	...	358 13 3	9 18 1	4,150
15 0 0	750 0 0	1/3⅝	...	36 4 4	...	...	1,661 12 10	...	11,751
15 0 0	408 0 2	1/4½	...	24 15 6	...	...	861 15 11	...	7,127
...	163 2 1	9⅞/₁₆	...	21 15 9	...	4 0 5	655 14 7	...	3,777
...	144 0 4	8	...	...	...	0 7 6	286 14 5	...	4,569
15 0 0	353 11 11	8	170 0 0	47 9 9	...	...	1,802 5 0	...	10,337
...	614 15 3	1/9¼	...	23 19 2	...	3 15 3	1,125 12 11	...	7,912
...	...	...	...	..	66 0 0	0 1 3	218 8 6	65 15 0	...
...	...	...	...	...	151 10 5	...	291 5 2	114 3 2	...
...	140 0 0	1/3⅞/₁₆	...	...	...	2 1 8	306 15 11	78 5 7	2,716
...	219 15 10	8¾	...	...	...	...	668 9 2	15 12 2	5,522
...	180 0 0	6⅞/₁₆	...	32 7 9	7 4 0	1 3 1	547 17 2	...	6,229
...	497 7 9	7¾	...	44 10 9	...	2 19 9	1,977 15 5	...	15,306
20 0 0	650 0 0	1/11	...	32 2 1	...	4 0 0	1,680 15 10	88 9 10	7,790
...	230 5 9	9½	...	17 8 1	...	0 1 0	491 18 10	15 6 6	5,580
...	350 0 0	7⅞	...	19 6 11	...	10 18 1	1,071 11 4	...	10,018
40 0 0	296 8 2	7	...	32 7 7	...	2 10 0	1,061 0 3	...	10,148
...	183 8 9	7½	...	21 15 9	...	0 2 6	551 19 8	...	5,875
...	184 2 0	9¼	...	...	...	...	311 6 3	...	5,309
...	454 19 3	1/2	...	26 8 1	...	0 1 0	1,376 2 1	...	9,440
...	220 19 5	8¼	...	43 4 8	7 3 6	...	749 0 1	...	6,998
...	209 13 8	6¼	...	27 4 4	...	6 4 5	1,004 13 7	56 10 9	5,663
20 0 0	900 0 0	1/0¼	600 0 0	54 8 9	20 14 1	12 14 3	3,434 9 2	...	19,207
30 0 0	1,200 0 0	11⅜	...	29 18 8	36 14 6	8 15 9	3,509 13 7	179 12 2	27,650
...	242 12 6	4½	...	19 17 9	62 8 2	0 5 0	1,006 17 2	...	12,167
15 0 0	250 0 10	10½	...	31 16 9	16 10 7	1 12 0	944 2 1	...	6,598
...	850 0 0	11⅜/₁₆	...	64 0 2	20 0 0	3 10 6	2,155 10 11	72 14 10	18,133
20 0 0	...	...	...	...	320 10 5	...	755 0 5	...	...
...	216 2 1	3	...	...	...	5 0 2	1,112 7 4	...	14,740
4 0 0	200 0 0	10	...	28 9 5	...	...	496 0 7	...	5,318
...	1,350 0 0	8½	500 0 0	36 15 4	...	1 7 6	3,619 8 6	...	40,883
200 0 0	2,000 0 0	1/2	...	97 6 0	...	12 18 9	3,883 5 11	898 18 4	39,360
...	700 0 0	1/-	...	6 0 0	...	7 8 10	2,727 1 0	...	12,561
20 0 0	300 0 0	9	...	32 13 1	...	2 2 9	1,584 8 0	37 12 9	8,218
15 0 0	209 19 4	11	...	33 9 4	...	3 13 6	547 10 11	...	4,544
...	400 0 0	9	...	46 0 0	...	...	1,549 9 3	38 11 2	10,184
4 0 0	280 0 0	9¼	...	25 6 4	...	0 13 6	831 2 8	...	7,604
...	200 0 0	1/1½	...	50 1 4	4 10 0	...	819 16 9	153 4 2	4,106
...	291 0 0	9	...	23 18 8	...	1 4 8	701 12 8	154 9 9	7,701
...	367 6 4	*	...	...	...	...	861 10 7	28 17 2	10,973
...	388 6 4	10¼	...	27 15 2	15 9 6	8 18 9	1,240 12 3	...	9,536
...	267 5 6	10½	...	22 1 2	...	0 15 0	611 19 9	...	5,569
...	461 13 9	10⅝	...	46 5 6	...	7 0 2	980 6 6	...	10,476
60 0 0	382 16 5	8	...	34 0 2	...	3 0 6	1,244 8 3	...	11,382
...	200 0 0	10¼	...	21 10 4	...	...	507 4 7	...	4,425
...	500 0 0	9⅛	...	45 6 4	...	...	1,423 16 10	...	13,535
...	210 0 0	1/-	...	22 1 2	3 11 6	1 9 6	478 10 8	191 17 6	5,084
...	286 4 4	1/1⅛	800 0 0	32 2 0	...	...	1,409 6 0	...	5,722
...	320 0 0	1/4	...	25 11 9	...	...	711 3 5	...	5,880
75 0 0	1,100 0 0	1/-	...	34 0 2	...	1 11 8	3,303 10 3	93 15 11	24,254
...	190 0 0	1/1½	...	...	...	...	377 16 10	...	4,679
...	362 1 7	8¼	...	21 15 9	...	...	886 7 3	...	11,619
...	200 8 11	9⅛/₁₆	...	23 8 4	...	...	584 11 9	6 10 9	4,816
1,282 0 0	90,585 0 8	...	6,440 11 7	2,512 2 10	816 10 1	1,454 6 6	239,830 11 6	29,391 10 1	1,679,667

* Ellon District—Owners, 4d.; Occupiers, 6¾d.. 2¾d.. 4¼d.: Old Deer District—Owners, 4d.: Occupiers, 4¾d.; New Deer District—Owners. 4d.; Occupiers, 4¾d.: Tarves District—Owners, 5d.; Occupiers, 5d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
ARGYLL.								
Mainland.								
Acharacle	...	...	56 8 0	202 9 3	21 12 0	...	...	...
Ardchattan and Muckairn	96 7 3	...	101 8 0	266 16 6	38 0 6	...	...	...
Achaleven (Comb.)	...	...	27 12 0	73 10 9	60 7 0	...	...	...
Taynuilt (Comb.)	...	...	37 4 0	72 14 6	13 19 0	...	...	...
Ardgour	5 10 0	5 4 5	54 12 0	179 11 3	20 9 6	...	...	...
Ardnamurchan	...	...	39 0 0	118 10 6	24 12 6	...	23 9 6	...
Campbeltown (B.)	...	277 10 5	951 0 0	2,864 18 3	356 12 6	108 12 6	525 19 8	...
Campbeltown (L.)	...	...	154 4 0	404 19 5	97 16 6	27 15 2	...	30 0 0
Craignish	...	...	19 16 0	58 1 6	7 8 6	...	...	6 0 0
Cumlodden	...	...	42 12 0	98 15 0	15 19 6	...	83 6 1	6 0 0
Dunoon and Kilmun	5,723 10 6	196 16 0	796 4 0	2,286 6 3	428 11 6	313 14 1	...	70 10 9
Glassary	...	...	116 8 0	331 2 2	133 13 0	...	92 5 10	17 11 10
Glenaray and Inveraray	187 17 5	...	84 0 0	238 7 3	111 10 0	...	...	...
Glenorchy	130 4 10	...	62 8 0	189 10 9	73 8 0	...	...	...
Inverchaolain	...	...	21 12 0	78 10 0	58 2 0	...	...	...
Kilbrandon and Kilchattan	58 12 1	5 18 0	139 16 0	386 6 2	152 8 6	...	70 3 10	...
Kilcalmonell	...	...	51 0 0	151 3 6	59 2 6	...	...	...
Kilchrenan and Dalavich	...	...	42 0 0	156 5 9	15 15 0	...	...	...
Kilfinan	...	0 13 6	174 0 0	504 14 4	105 5 0	36 3 0	...	10 17 6
Killean and Kilchenzie	...	...	66 0 0	221 7 6	64 15 0	...	...	...
Kilmartin	120 13 4	2 1 0	57 0 0	170 11 10	21 7 6	18 5 0	...	9 15 7
Kilmodan	...	...	17 8 0	67 7 3	16 10 6	...	...	...
Kilmore and Kilbride	...	...	24 12 0	103 0 9	9 4 6	...	...	...
Kilninver and Kilmelford	30 11 10	...	30 12 0	90 4 6	31 9 6	...	...	...
Lismore and Appin	268 14 9	...	195 0 0	587 5 0	233 2 6	25 13 9	...	...
Lochgilphead	756 4 11	3 10 0	282 0 0	786 5 9	105 15 0	39 9 11	70 9 11	20 0 0
Lochgoilhead and Kilmorich	...	7 8 2	45 0 0	128 2 6	16 17 6	5 6 0	...	6 0 0
Morvern	...	...	52 16 0	172 9 9	89 11 6	...	...	...
North Knapdale	...	...	52 16 0	188 1 4	129 16 0	...	36 16 2	10 0 0
Oban (B.)	...	5 15 9	457 16 0	1,620 2 9	171 13 6	51 7 7	...	35 0 0
Saddell and Skipness	107 6 1	...	83 8 0	248 17 0	71 5 6	...	...	10 0 0
Southend	...	...	59 8 0	164 0 3	22 5 6	6 6 0	...	10 0 0
South Knapdale	27 12 11	...	60 12 0	265 15 6	22 14 6	10 12 0	...	...
Stralachlan and Strachur	...	...	46 16 0	137 14 3	57 11 0	29 15 7	...	...
Strontian	11 13 1	0 1 4	43 4 0	126 6 9	16 4 0	...	...	...
Tarbert	...	28 11 6	217 16 0	578 0 3	81 13 6	19 10 4	244 12 1	44 0 0
Insular.								
Coll	...	...	43 4 0	144 12 6	16 4 0	...	15 12 7	...
Colonsay and Oronsay	22 11 0	...	15 0 0	42 3 0	5 12 6	...	...	...
Gigha and Cara	30 3 6	2 7 0	40 4 0	96 8 3	55 1 6	...	4 13 7	10 0 0
Jura	...	...	57 12 0	198 15 9	125 13 0	32 17 7	...	7 10 0
Kilarrow and Kilmeny	...	...	283 16 0	806 17 6	166 8 6	...	...	15 0 0
Kilchoman	...	...	238 16 0	651 13 3	149 11 0	...	28 13 3	21 12 2
Kildalton	...	...	151 4 0	452 7 5	96 14 0	...	...	33 4 2
Kilfinichen and Kilvickeon	300 16 11	...	143 8 0	386 18 3	148 3 10	16 14 0	89 0 11	...
Kilninian and Kilmore	1 0 2	...	192 0 0	545 0 5	82 0 0	9 2 10	...	22 11 2
Salen	45 11 0	...	33 12 0	99 13 0	14 3 6	...	...	...
Torosay	...	4 17 0	45 3 0	154 2 9	17 15 6	19 13 0	47 17 2	...
Tyree	...	7 12 7	150 0 0	373 12 10	146 5 0	38 8 10	325 2 5	10 6 5
Total of Argyll	7,925 1 7	548 6 8	6,257 7 0	18,110 10 11	3,980 7 4	809 5 2	1,658 3 0	405 19 7

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	252 11 8	1/2	...	...	...	34 0 0	567 0 11	128 17 0	4,579
...	700 0 0	8	...	...	...	...	1,202 12 3	...	18,174
...	...	...	...	...	175 0 9	...	336 10 6	...	...
...	...	...	...	...	110 13 8	...	234 11 2	131 10 7	...
...	170 0 0	9	...	...	...	4 6 0	439 13 2	38 16 7	4,600
...	199 17 6	1/11¾	...	...	...	...	405 10 0	21 16 1	2,248
284 2 10	2,500 0 0	*	3,000 0 0	171 19 6	19 0 0	12 9 10	11,072 5 6	448 5 0	35,325
...	600 0 0	†	...	...	...	0 2 0	1,314 17 1	365 18 6	22,344
...	72 0 0	8½	...	...	...	...	163 6 0	15 8 7	2,371
...	139 11 1	1/3	...	...	...	...	386 3 8	...	2,184
236 16 7	4,200 0 0	1/0½	...	...	...	145 1 8	14,397 11 4	...	85,336
...	470 0 0	1/7½	...	...	...	6 0 0	1,167 0 10	44 3 8	5,887
..	423 5 10	1/7	1,800 0 0	14 8 5	...	33 8 8	2,892 17 7	149 3 2	5,485
...	380 0 0	6	...	...	...	...	835 11 7	...	15,650
...	151 7 11	9⅝	...	...	...	5 8 0	314 19 11	10 10 10	3,965
...	300 0 0	1/5	...	...	...	...	1,113 4 7	178 2 6	4,704
...	318 15 0	1/8	...	...	...	10 12 7	590 13 7	...	3,132
...	175 0 0	11	...	...	20 7 4	...	409 8 1	86 17 8	3,682
9 18 4	423 2 5	7	...	...	...	...	1,264 14 1	214 1 8	14,998
...	404 18 0	11⅝	...	...	4 18 4	...	761 18 10	139 6 11	10,022
...	180 0 0	10	...	4 3 3	...	2 19 9	586 17 3	...	4,695
...	270 19 3	1/4⅓	...	...	...	...	372 5 0	80 12 7	4,082
...	310 0 0	6	...	...	...	...	446 17 3	...	9,279
...	157 9 2	8	...	...	...	10 0 0	350 7 0	...	3,647
...	667 0 0	8¼	...	...	...	20 0 0	1,996 16 0	...	19,508
15 4 6	395 9 9	8	...	...	...	49 5 4	2,523 15 1	...	11,910
...	340 0 0	1/11½	...	...	...	...	548 14 2	32 15 6	6,680
...	350 0 0	1/6	...	...	...	...	664 17 3	...	4,759
...	380 0 0	1/9¾	...	...	...	2 7 8	799 17 2	...	4,040
243 0 7	2,600 0 0	1/5	...	...	...	64 1 7	5,248 17 9	368 1 7	38,870
...	385 6 10	1/3	...	...	...	0 1 6	906 4 11	...	6,012
...	250 0 0	7	...	...	...	...	511 19 9	254 13 5	9,354
...	335 0 0	1/	...	...	...	...	662 6 11	0 11 8	5,921
...	217 5 4	9½	...	...	...	0 18 2	489 18 4	69 2 8	5,104
...	85 9 2	5½	...	...	...	30 0 0	312 18 4	81 8 4	3,282
70 10 8	552 18 10	1/3	...	...	...	3 3 0	1,840 16 2	320 14 6	7,945
...	210 0 0	1/9⅞	...	...	...	...	429 13 1	60 4 3	2,516
...	86 4 10	1/2½	...	...	...	2 0 0	173 11 4	...	1,650
...	55 0 0	6½	...	...	...	...	293 17 10	...	1,910
...	287 10 2	1/4	...	...	...	25 0 0	734 18 6	...	4,249
10 14 1	545 2 4	9	...	...	...	35 15 1	1,863 13 6	50 13 5	15,013
...	467 18 7	10	...	...	...	34 16 2	1,593 0 5	...	11,172
...	428 14 5	9	...	...	...	30 0 0	1,192 4 0	11 3 1	11,164
...	229 5 5	7	...	...	...	‡57 2 6	1,371 14 10	...	4,918
11 11 11	700 0 0	1/9	...	...	...	119 0 0	1,682 6 6	...	8,897
...	160 14 6	9	...	...	...	30 0 0	383 14 0	...	4,213
...	350 9 1	1/11¾	...	...	...	20 0 0	659 17 6	...	3,905
...	450 0 0	2/2	...	...	...	1 5 4	1,502 13 5	149 13 7	4,482
881 19 6	23,328 7 1	...	4,800 0 0	190 11 2	330 0 1	789 4 10	70,015 3 11	3,952 13 4	464,863

* Owners, 8d.; Occupiers, 2¼d., 9d. † Owners, 3½d. ; Occupiers, 1¼d., 5d.
‡ Contribution from Northern Lighthouse Board, £25.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
AYR.								
Alloway and Ayr (L.)	94 4 6	...	113 8 0	219 1 6	42 1 6	...	...	...
Ardrossan	...	656 11 9	1,079 8 0	2,634 5 8	404 15 6	503 11 7	...	180 11 6
Auchinleck	...	...	686 8 0	1,299 19 6	277 8 0	...	...	...
Ayr (B.)	...	1,006 14 11	2,472 12 0	6,114 14 9	870 19 6	948 7 4	...	332 12 6
Ballantrae	112 10 10	2 2 6	117 0 0	277 14 0	63 17 6	...	...	...
Barr	...	...	51 12 0	...	19 7 0	...	...	...
Beith	...	3 12 6	688 8 0	1,433 8 6	250 13 0	180 0 7	174 15 9	30 0 1
Colmonell	115 13 7	...	172 16 0	363 19 6	64 16 0	...	...	...
Coylton	216 1 6	10 5 4	295 16 0	545 19 3	110 18 6	20 11 2	...	13 4 5
Craigie	121 3 9	...	27 0 0	56 8 0	10 2 6	...	...	...
Crosshill	...	...	114 0 0	221 7 6	62 15 0	...	...	...
Dailly	108 18 7	...	138 0 0	48 6 3	51 15 0	15 7 10	...	9 9 10
Dalmellington	152 18 3	95 5 1	621 0 0	1,253 1 2	232 17 6	26 10 4	245 5 8	4 8 4
Dalry	...	...	766 4 0	1,546 19 0	285 1 6	80 3 11	401 17 0	76 6 1
Dalrymple	40 15 5	...	142 4 0	276 6 6	51 19 6	...	...	...
Dreghorn	130 9 0	0 14 0	492 12 0	938 7 9	184 14 6	109 0 8	...	23 8 5
Dundonald	78 16 6	3 13 6	669 12 0	1,394 12 3	251 2 0	101 17 11	...	60 0 0
Dunlop	...	6 7 6	109 16 0	213 1 3	41 3 6	...	...	...
Fenwick	11 17 5	5 16 0	70 16 0	144 8 6	26 11 0	...	...	6 14 10
Galston	....	4 7 6	610 16 0	1,315 14 9	229 1 0	193 11 9	208 11 4	34 10 3
Girvan (B)	...	...	354 12 0	910 12 8	132 19 6	...	112 8 1	86 5 3
Girvan (L.)	...	...	196 4 0	409 16 6	73 11 6	...	...	...
Irvine (B.)	...	318 9 0	964 4 0	1,872 7 5	361 11 6	512 15 1	415 3 5	126 1 7
Irvine (L.)	...	2 12 0	94 16 0	168 6 9	35 11 0	14 0 4	...	4 18 7
Kilbirnie	...	0 17 6	632 8 0	1,284 5 11	237 3 0	155 15 4	257 11 9	25 18 8
Kilmarnock (B.)	...	1,771 12 4	3,105 0 0	7,252 10 0	1,164 7 6	1,368 4 10	1,101 15 10	255 0 0
Kilmarnock (L.)	...	...	164 8 0	314 10 6	61 13 0	...	...	...
Kilmaurs	32 12 2	...	462 12 0	869 5 3	173 9 6	91 9 6	...	22 3 11
Kilwinning	...	3 0 6	861 12 0	1,689 0 3	323 2 0	58 2 2	...	...
Auchentiber (Comb.)	...	...	36 12 0	78 17 9	53 14 6	...	...	...
Kirkmichael	57 12 9	...	58 4 0	108 6 6	61 16 6	...	...	...
Kirkoswald	0 14 0	9 9 9	130 16 0	237 13 5	89 1 0	...	...	...
Largs	...	...	337 16 0	736 5 11	166 13 6	...	...	...
Loudoun	244 4 9	9 3 0	747 0 0	1,589 5 3	280 2 6	186 13 2	160 18 10	...
Mauchline	74 2 10	0 12 6	276 0 0	554 7 2	103 10 0	31 1 7	...	5 3 7
Maybole	...	11 18 0	802 16 0	1,794 13 11	301 1 0	172 6 7	156 15 11	55 11 11
Monkton and Prestwick	...	136 1 2	346 16 0	1,229 3 3	125 6 6	...	...	...
Muirkirk	...	23 15 0	562 16 0	1,108 5 8	211 5 6	222 1 9	241 14 5	34 15 6
New Cumnock	...	1 15 0	703 4 0	1,385 0 9	263 14 0	57 19 11	232 13 6	37 14 8
Ochiltree	59 10 11	...	161 8 0	319 15 6	60 10 6	...	...	...
Old Cumnock	2,039 17 8	15 18 0	490 16 0	1,003 11 4	214 1 0	35 13 11	192 15 8	69 1 10
Riccarton	...	...	438 12 0	811 6 9	234 9 6	155 6 4	25 19 0	...
St. Quivox	...	...	135 0 0	...	50 12 6	...	...	...
Skelmorlie	365 11 11	18 2	86 8 0	175 10 3	62 8 0	...	...	...
Sorn	...	...	307 4 0	607 19 6	155 4 0	61 16 1	...	21 11 2
Stair	87 6 7	21 6 8	108 0 0	216 9 3	40 10 0	19 17 11	...	3 6 4
Stevenston	...	13 5 0	884 8 0	1,735 19 10	331 13 0	180 6 5	257 3 3	30 1 1
Stewarton	...	58 1 0	300 0 0	606 19 11	112 10 0	53 7 11	...	15 0 0
Straiton	68 11 6	11 2 10	122 8 0	234 0 3	85 18 0	...	...	2 10 0
Symington	...	...	34 4 0	61 17 6	12 16 6	...	...	...
Tarbolton	1 5 0	...	433 16 0	817 0 2	162 13 6	45 15 4	...	18 2 8
West Kilbride	...	7 7 6	205 4 0	430 7 7	76 19 0	23 13 7	...	5 11 8
Total of Ayr	4,285 9 5	4,237 15 6	23,964 12 0	50,911 8 3	9,351 18 6	5,575 10 10	4,185 9 5	1,590 4 8

School Boards for the Year ended the 15th May 1907.—INCOME—*continued*.

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	444 13 8	6	...	...	...	*39 18 1	953 7 3	...	17,815
494 0 0	5,100 0 0	1/5	2,000 0 0	...	...	14 3 10	13,067 7 10	...	72,213
...	1,550 0 0	†	...	...	...	0 15 0	3,814 10 6	401 2 3	26,693
...	10,200 0 0	1/4$\frac{3}{5}$	‡ 7,500 0 0	...	...	161 17 8	29,607 18 8	...	151,946
20 0 0	503 7 10	11½	...	20 0 0	...	...	1,116 12 8	...	10,597
...	350 11 3	9$\frac{7}{8}$	...	...	26 8 1	2 0 0	449 18 4	157 0 4	10,171
123 0 0	1,300 0 0	9½	...	17 10 0	...	9 8 6	4,190 16 11	246 12 6	33,754
...	600 0 0	7$\frac{1}{8}$	...	...	...	3 8 11	1,320 14 0	...	21,130
...	523 19 3	10	1,470 0 0	...	...	2 6 3	3,209 1 8	...	13,729
...	157 13 4	4	...	...	...	...	372 12 7	...	9,778
...	273 15 7	10	...	...	...	...	671 18 1	104 10 6	6,850
...	410 0 0	8	...	...	...	...	781 17 6	119 18 4	12,266
...	770 0 0	9½	...	...	...	†64 7 0	3,465 13 4	143 11 1	19,749
42 19 6	1,500 0 0	10$\frac{5}{8}$	...	...	...	...	4,699 11 0	734 8 7	37,439
...	360 0 0	6	...	7 10 0	25 19 10	2 10 0	907 5 3	...	14,201
...	1,050 0 0	1/0$\frac{3}{4}$	1,160 0 0	...	...	23 0 0	4,112 6 4	...	21,055
...	2,350 0 0	9½	...	...	...	1 0	4,910 14 2	176 3 10	60,542
...	400 0 0	7$\frac{1}{8}$	...	...	10 0 0	5 15 5	786 3 8	64 2 7	14,492
...	260 0 0	3$\frac{5}{8}$	...	...	...	1 16 0	527 19 9	...	16,884
...	1,200 0 0	10	...	125 0 0	...	2 8 5	3,924 1 0	744 1 2	29,200
148 17 11	525 0 0	9$\frac{1}{2}$	1,300 0 0	...	...	1 0 0	3,571 15 5	508 5 3	14,170
...	550 0 0	8$\frac{7}{16}$	...	...	...	...	1,229 12 0	411 17 9	15,960
...	1,657 4 10	1/2	5,000 0 0	...	...	...	11,227 16 10	33 2 7	29,290
...	325 0 0	8	...	...	...	0 10 0	645 14 8	...	9,650
...	1,300 0 0	1/0$\frac{1}{2}$	...	...	155 0 2	27 1 9	4,076 2 1	1,281 5 5	26,635
925 0 0	6,552 9 9	1/1$\frac{1}{4}$	700 0 0	46 15 1	...	$7,776 0 3	32,018 15 7	...	123,937
...	500 0 0	6$\frac{1}{4}$	1,000 0 0	...	...	1 11 8	2,042 3 2	...	19,653
...	1,200 0 0	1/3$\frac{1}{2}$	...	15 7 1	...	22 18 0	2,889 17 5	...	22,520
...	2,100 0 0	1/	400 0 0	1 18 8	...	15 0 0	5,451 15 7	...	42,723
...	...	...	...	...	77 0 8	...	246 4 11	80 0 0	...
...	244 11 10	8$\frac{1}{2}$	...	...	...	...	530 11 7	...	3,012
...	414 17 1	8$\frac{1}{2}$	...	...	...	0 5 0	882 16 3	24 6 10	12,632
80 0 0	1,200 0 0	‖	...	...	124 0 5	12 13 7	2,657 9 5	203 19 8	41,930
112 5 1	1,800 0 0	1/2	...	115 0 0	...	13 1 5	5,207 14 0	...	31,322
..	450 0 0	6$\frac{7}{8}$	...	40 0 0	20 0 0	8 17 1	1,563 14 9	104 12 0	16,046
168 0 0	2,247 11 6	1/6	...	...	...	0 3 9	5,710 18 7	...	32,321
...	1,300 0 0	10	850 0 0	...	...	11 3 6	3,998 10 5	...	32,491
30 0 0	1,700 0 0	1/4½	...	...	...	¶ 55 10 0	4,190 3 10	...	25,749
...	2,000 0 0	1/4$\frac{55}{64}$	2,325 0 0	...	...	12 10 0	7,019 11 10	...	29,672
...	585 0 0	**	...	5 17 2	...	...	992 2 1	...	17,689
149 0 0	1,300 0 0	1/1$\frac{3}{4}$	...	...	...	23 2 5	5,533 17 10	428 3 3	22,534
25 17 8	1,402 8 6	1/6		...	...	9 12 0	3,103 11 9	1,695 6 7	20,836
			...	...					
...	220 0 0	3$\frac{1}{8}$	...	...	...	0 2 6	405 15 0	176 8 4	13,766
...	287 4 4	††	...	...	...	11 14 11	1,014 15 7	...	16,312
...	559 17 10	‡‡	...	...	...	2 2 6	1,715 15 1	339 11 10	19,866
...	167 3 9	5	...	...	...	...	664 0 6	...	8,481
...	2,000 0 0	11½	1,325 0 0	...	...	38 6 0	6,796 2 7	...	42,387
...	1,000 0 0	11½	...	...	...	§§39 0 3	2,184 19 1	775 11 11	23,795
...	422 2 5	10$\frac{1}{4}$	...	1 10 4	...	0 10 0	948 13 4	...	10,762
...	180 0 0	8$\frac{3}{4}$	...	...	...	15 12 5	304 10 5	15 17 2	5,025
...	1,010 12 4	1/	...	...	...	3 11 3	2,563 6 3	37 7 10	23,326
...	850 0 0	8½	...	...	...	35 8 0	1,634 11 4	42 10 3	26,615
2,319 0 2	65,155 10 1	...	25,030 0 0	396 8 4	438 9 2	8,472 3 4	205,913 19 8	9,049 17 10	1,386,611

* Rents, £25. † Owners, 7$\frac{5}{16}$d; Occupiers, 2$\frac{13}{20}$d., 7$\frac{1}{16}$d., 10$\frac{3}{4}$d. ‡ Rents,
§ Grant from Department towards erection of Technical School, £7550. ‖ Owners, 3½d.; Occupiers, 1$\frac{5}{16}$d, 2$\frac{5}{6}$d, 3$\frac{5}{16}$d.
¶ Rents, £48 18s. 3d. ** Owners, 2$\frac{1}{4}$d.; Occupiers, 1$\frac{1}{16}$d, 3$\frac{3}{4}$d, 2$\frac{1}{2}$d. †† Inverkip District—Owners, 2d; Occupiers, 2$\frac{1}{4}$d., 1$\frac{15}{16}$d, $\frac{1}{4}$d;
Largs District—Owners, 2d; Occupiers, $\frac{3}{4}$d., 1$\frac{1}{2}$d., 2$\frac{1}{4}$d. ‡‡ Owners, 3d; Occupiers, 1$\frac{1}{4}$d., 3$\frac{3}{4}$d §§ Rents, £27 13s.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
BANFF.								
Aberlour	...	...	283 16 0	749 3 4	106 8 6	...	119 10 0	...
Alvah	...	...	91 4 0	306 0 9	177 2 0	20 18 10	...	...
Banff (B.)	...	64 14 0	387 0 0	1,157 13 5	145 2 6	36 5 3	200 2 0	...
Banff (L.) and Ord	24 18 8	0 13 9	78 12 0	146 17 3	29 9 6	...	...	...
Boharm	...	...	90 12 0	335 5 6	164 4 0	9 0 5	91 11 0	...
Botriphnie	...	...	57 12 0	250 13 8	116 3 0	17 16 4	133 3 7	...
Boyndie	206 17 6	...	204 0 0	418 4 9	166 10 0	...	114 2 9	...
Cabrach	70 13 7	...	51 0 0	112 2 1	99 2 6	...	5 2 9	...
Cullen	...	21 10 6	252 12 0	552 1 9	94 14 6	15 13 7	359 0 9	...
Deskford	...	...	54 12 0	110 17 3	61 12 0	...	...	...
Enzie	20 15 7	6 6 9	168 8 0	...	94 14 6	8 0 8	117 7 5	...
Fordyce	...	...	649 0 0	1,427 10 4	184 1 0	41 8 3	202 9 2	...
Forglen	...	...	59 8 0	125 5 9	62 5 6	...	...	...
Gamrie	74 14 5	28 15 0	616 16 0	1,296 15 3	331 6 0	68 0 9	217 11 2	...
Glenrinnes	...	...	27 0 0	76 7 9	60 2 6	...	8 14 2	...
Grange	32 1 1	...	138 12 0	289 12 4	51 19 6	...	...	...
Inveravon	...	...	144 0 0	338 17 0	174 0 0	...	...	...
Inverkeithny	73 4 3	...	64 4 0	138 10 3	74 1 6	5 17 10	...	...
Keith	182 0 2	54 13 10	677 8 0	1,500 19 7	435 12 0	73 16 2	227 1 5	10 16 0
Kirkmichael	...	...	64 16 0	157 1 6	24 6 0	...	...	...
Marnoch	...	...	276 12 0	604 1 9	278 14 6	...	105 8 4	...
Mortlach	...	2 10 6	311 8 0	798 10 6	116 15 6	...	121 19 10	...
Ordiquhill	...	...	88 4 0	358 9 2	111 1 0	...	...	...
Rathven	17 16 11	...	798 8 0	2,591 17 1	495 8 0	40 12 7	882 8 2	37 19 2
Rothiemay	...	...	160 4 0	346 16 6	60 1 6	...	43 5 1	...
Total of Banff	703 2 2	179 4 4	5,795 8 0	14,189 14 6	3,714 17 6	337 10 8	2,948 17 7	48 15 2
BERWICK.								
Abbey St. Bathans	51 14 10	1 1 1	24 12 0	58 0 0	49 4 6	...	7 15 7	...
Ayton	12 4 6	...	136 16 0	246 8 6	81 6 0	...	...	...
Bunkle and Preston	...	...	28 4 0	57 16 0	60 11 6	...	...	...
Channelkirk	3 10 4	...	34 4 0	126 0 9	113 1 0	...	...	...
Chirnside	...	21 16 10	112 4 0	229 12 0	42 1 6	...	...	...
Cockburnspath	...	...	113 6 0	240 7 3	58 18 6	...	...	...
Coldingham	...	10 14 5	234 12 0	595 19 3	237 19 6	...	...	...
Coldstream	23 4 4	5 12 1	200 8 0	417 18 6	115 3 0	15 0 9	...	...
Cranshaws	124 18 7	...	15 12 0	42 17 0	45 17 0	...	...	...
Duns	89 10 2	31 12 9	218 8 0	430 9 0	121 18 0	...	...	...
Earlston	...	...	117 12 0	215 19 3	44 2 0	...	...	...
Eccles	...	...	118 16 0	217 19 9	44 11 0	13 13 4	...	...
Edrom	...	...	102 12 0	269 4 6	158 9 6	...	...	...
Eyemouth	...	...	339 12 0	641 12 6	127 7 0	...	132 5 8	...
Fogo	...	...	40 16 0	164 19 6	65 6 0	10 16 0	...	...
Foulden	1 3 10	...	31 16 0	115 4 9	101 18 6	...	...	...
Gordon	...	14 10 3	70 16 0	132 4 0	26 11 0	17 8 6	...	...
Greenlaw	65 17 9	1 15 0	87 12 0	180 7 0	62 17 0	10 19 2	...	...
Hume and Stitchell	24 15 2	...	52 4 0	110 10 2	119 11 6	9 0 0	...	...
Hutton	...	5 18 6	77 8 0	209 9 6	119 0 6	12 8 8	...	...
Ladykirk	9 12 6	...	21 0 0	36 4 0	7 17 6	...	...	...
Langton	...	10 6 3	42 12 0	157 16 3	55 19 6	11 15 6	...	...
Lauder	51 7 11	...	123 12 0	291 2 4	45 0 0	...	...	...
Legerwood	87 5 3	...	32 8 0	70 0 6	54 17 0	...	...	...
Longformacus	3 15 2	...	16 4 0	42 0 6	6 1 6	...	...	...
Mertoun	133 9 0	...	36 12 0	72 16 0	63 14 6	...	...	...
Mordington	...	...	29 8 0	52 10 9	51 0 6	...	...	...
Nenthorn	106 11 1	...	17 4 0	60 15 3	50 7 0	...	...	...

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
65 0 0	450 0 0	11	...	36 17 1	...	8 18 0	1,819 7 11	364 18 10	10,832
...	300 0 0	8¼	...	22 6 8	...	7 6 2	924 18 5	...	8,663
105 0 0	500 0 0	11½	...	112 5 11	...	*88 0 5	2,796 3 6	816 17 3	11,400
...	262 2 6	9½	450 0 0	20 19 6	...	...	1,013 13 2	...	7,092
...	330 0 0	1/2	...	26 13 11	...	0 14 0	1,048 0 10	...	5,906
...	200 0 0	10 7/10	...	25 17 3	6 13 1	1 0 10	808 19 9	9 12 6	5,039
...	300 0 0	8	600 0 0	21 4 11	...	...	2,030 19 11	...	7,049
...	250 0 0	1/5 7/10	...	20 3 2	...	1 13 6	609 17 7	61 3 9	3,506
18 0 0	450 0 0	1/10¾	...	36 0 2	...	...	1,799 13 3	160 19 8	5,017
...	140 0 0	8	...	29 17 8	...	2 4 11	399 3 10	61 16 5	4,149
10 0 0	331 3 1	1/0¾	...	29 18 8	...	1 13 0	788 7 8	584 7 1	7,631
213 0 0	1,300 0 0	1/8	...	266 18 7	...	†118 18 10	4,403 6 2	127 6 4	18,312
...	175 0 0	9¼	...	21 15 9	...	...	443 15 0	16 15 0	4,440
46 0 0	640 0 0	7½	...	83 13 1	...	0 8 0	3,403 19 8	...	21,399
10 0 0	115 1 4	1/10	...	23 19 2	...	1 0 10	322 5 9	...	1,351
...	311 4 2	8¾	...	3 17 8	...	...	827 6 9	211 16 8	8,363
25 0 0	450 0 0	1/	...	64 9 10	...	...	1,196 6 10	390 14 1	9,423
...	130 0 0	5 7/8	...	18 5 2	...	...	504 3 0	...	4,901
82 5 0	600 0 0	6¼	...	51 2 7	...	17 2 9	3,912 17 6	...	22,056
15 0 0	333 0 0	10	285 0 0	25 6 4	...	‡50 0 0	954 9 10	...	5,757
28 0 0	490 0 0	11½	...	33 3 10	66 15 10	6 17 1	1,889 13 4	36 11 11	11,279
65 0 0	675 0 0	1/0½	...	34 0 2	...	0 5 0	2,125 9 6	796 10 10	13,275
...	105 0 0	8½	...	23 13 10	...	2 5 11	688 13 11	...	3,373
99 18 5	1,750 0 0	1/5	330 0 0	48 9 8	...	15 6 7	7,108 4 7	164 13 7	26,065
10 10 8	240 0 0	10	...	34 8 3	43 1 10	6 10 0	944 17 10	...	5,764
792 14 1	10,827 11 1	...	1,665 0 0	1,115 2 10	116 10 9	330 0 10	42,764 15 6	3,804 3 11	232,092
...	115 0 0	1/15 8	...	1 8 6	...	3 10 0	312 6 6	...	2,061
...	300 0 0	5⅜	...	...	...	1 12 8	778 7 8	...	13,021
...	89 10 6	3½	...	...	...	...	236 2 0	...	7,839
...	120 0 0	4 9/10	...	...	...	...	396 16 1	...	5,654
...	310 0 0	7	...	...	...	...	715 14 4	...	9,947
...	494 19 4	1/4½	...	...	...	1 0 0	908 11 1	115 19 3	8,829
...	1,030 0 0	10	...	...	...	8 2 0	2,117 7 2	...	25,658
50 0 0	730 0 0	11	...	...	...	0 15 0	1,558 1 8	...	17,060
...	120 0 0	1/8½	...	...	...	...	349 4 7	36 5 5	1,722
...	780 0 0	9 3/10	...	...	...	0 16 6	1,672 14 5	16 9 10	20,813
...	470 0 0	10⅝	...	...	6 17 0	5 5 3	859 15 6	126 9 1	11,799
...	475 0 0	7½	...	...	...	4 19 3	874 19 4	...	15,810
...	400 0 0	7⅛	...	...	...	...	930 6 0	...	14,378
...	350 0 0	9½	...	...	...	16 4 7	1,607 1 9	150 14 3	8,154
...	200 0 0	11	...	...	...	...	481 17 6	...	4,982
...	63 0 0	2⅝	...	...	...	...	313 3 1	...	3,876
...	220 0 0	7½	...	...	...	3 6 0	484 15 9	58 11 0	8,429
...	300 0 0	8	...	...	...	...	709 7 11	...	9,397
...	183 15 8	6¾	...	...	...	0 13 7	500 10 1	...	6,869
...	150 0 0	5 3/10	...	...	...	...	574 5 2	32 2 9	6,828
...	160 0 0	10⅕	...	...	...	...	234 14 0	...	4,451
...	180 0 0	8¾	...	...	...	...	458 9 6	...	5,092
30 0 0	600 0 0	10	...	...	...	5 17 6	1,146 19 9	...	15,183
...	110 0 0	5 7/12	...	...	...	...	354 10 9	...	5,655
...	80 0 0	3	...	...	...	...	148 1 2	...	5,408
...	100 0 0	3¼	...	...	...	...	406 11 6	...	7,495
...	105 0 0	7 7/16	...	...	...	...	237 19 3	...	3,856
...	200 0 0	1/3½	...	...	...	0 4 0	435 1 4	...	3,888

* From Educational Trust. £81 9s. 6d. † Price of Property sold, £60; Rents, £51
‡ Contribution towards extra teacher's salary, £20.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County	Balance in hand on 15th May 1906	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(*a*) Annual Grants and Drawing Grants.	(*b*) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
BERWICK.—*contd.*								
Polwarth	...	...	19 16 0	49 6 0	47 8 6	...	...	...
Swinton	...	2 7 6	73 16 0	139 1 6	57 13 6	...	...	...
Westruther	...	...	54 4 0	145 6 6	119 11 6	...	...	...
Whitsome	...	...	48 12 0	90 0 6	58 4 6	6 3 11	...	...
Total of Berwick	789 0 5	105 14 8	2,672 18 0	5,909 19 3	2,413 10 0	107 5 10	140 1 3	...
BUTE.								
Cumbrae	34 19 7	12 0 0	111 0 0	224 9 0	41 12 6	28 2 5	...	30 0 0
Kilbride	...	...	188 8 0	376 5 6	160 13 0	20 18 3	...	...
Kilmory	...	8 6 5	196 16 0	466 16 2	124 9 6	...	92 6 1	...
Kingarth	35 11 1	...	69 12 0	223 4 9	76 2 0	...	...	...
North Bute and Rothesay (L.)	4 0 6	...	87 12 0	184 19 6	72 17 0	...	...	...
Rothesay (B.)	73 6 11	308 17 2	725 8 0	1,676 12 10	272 0 6	102 7 2	...	...
Total of Bute	147 18 1	329 3 7	1,378 16 0	3,152 7 9	747 14 6	151 7 10	92 6 1	30 0 0
CAITHNESS.								
Bower	...	...	100 8 0	472 8 6	146 9 6	9 16 3	...	...
Canisbay	...	...	162 0 0	361 7 3	140 15 0	...	219 13 5	...
Dunnet	9 8 6	...	102 12 0	253 2 3	128 9 6	...	...	...
Halkirk	...	...	246 0 0	739 14 5	165 18 0	...	...	...
Keiss	376 4 9	...	107 8 0	275 11 0	120 5 6	16 11 2	67 12 6	...
Latheron	591 12 4	...	467 8 0	1,508 19 4	303 18 6	...	331 19 10	10 0 0
Olrig	...	...	118 16 0	417 4 4	44 11 0	11 0 11	33 1 4	10 0 0
Murkle (Comb.)	...	...	33 0 0	181 15 3	92 7 6	...	...	...
Reay	6 2 11	...	84 0 0	246 6 0	111 10 0	...	...	...
Thurso	51 6 5	...	479 8 0	1,319 8 9	219 15 6	...	323 14 6	...
Watten	283 14 6	...	99 0 0	372 9 11	264 8 6	11 11 5	8 8 3	...
Wick (B.) and Pulteneytown	...	28 7 10	1,159 4 0	3,246 0 5	434 14 0	127 6 8	776 19 9	...
Wick (L.)	...	...	230 8 0	536 0 1	286 8 0	...	...	...
Total of Caithness	1,318 9 5	28 7 10	3,389 12 0	9,930 7 6	2,459 10 6	176 6 5	1,761 9 7	20 0 0
CLACKMANNAN.								
Alloa (B.)	...	621 4 2	1,128 0 0	2,706 19 6	423 0 0	639 17 7	934 1 2	148 19 1
Alloa (L.)	321 7 11	36 2 7	578 2 0	1,027 5 3	200 9 6	96 10 9	125 0 8	17 0 0
Alva	...	24 3 6	498 12 0	1,024 3 6	186 19 6	71 4 4	333 12 4	41 8 1
Clackmannan	40 9 4	1 5 0	259 4 0	518 19 9	147 4 0	59 12 0	73 8 2	...
Dollar	...	...	115 4 0	208 0 9	43 4 0	...	...	...
Tillicoultry	50 16 6	21 9 4	460 16 0	1,010 4 11	172 16 0	143 11 1	274 18 1	28 0 0
Total of Clackmannan	412 13 9	704 4 7	3,039 18 0	6,495 13 8	1,173 13 0	1,010 15 9	1,741 0 5	235 7 2
DUMBARTON.								
Arrochar	175 19 11	...	28 4 0	76 18 6	60 11 6	...	...	...
Bonhill	536 1 10	31 6 8	1,255 4 0	2,749 16 10	470 14 0	279 17 3	267 0 6	91 2 5
Cardross	...	1 13 0	484 16 0	995 1 9	181 16 0	119 5 11	81 2 5	...
Cumbernauld	...	19 5 0	330 12 0	908 13 9	216 4 6	49 12 2	...	27 8 6
Dumbarton (B.)	...	632 0 3	1,608 12 0	3,506 5 9	603 4 6	346 8 3	515 18 10	29 10 0
Dumbarton (L.)	53 9 8	...	*...	...	...	...	...	...
Kilmaronock	...	...	51 0 0	103 11 6	99 2 6	...	...	...
Kirkintilloch (B.)	257 2 5	24 11 6	966 12 0	1,719 6 0	362 9 6	129 9 11	449 16 1	30 0 0
Lenzie (Comb.)	...	191 0 9	...	622 11 3	...	...	...	...
Kirkintilloch (L.)	...	...	246 0 0	482 6 9	92 5 0	33 15 11	...	14 0 11
Condorrat (Comb.)	...	...	104 8 0	201 18 2	39 3 0	39 4 0	...	22 19 8
Luss	...	...	64 4 0	164 6 3	74 1 6	...	...	...
New Kilpatrick	1,179 15 10	22 3 2	1,017 0 0	3,035 8 3	542 10 0	105 16 0	...	10 0 0
Old Kilpatrick	8,247 18 1	214 4 7	2,670 12 0	5,453 4 1	1,041 9 6	1,234 3 9	1,203 10 9	209 5 8
Roseneath	...	4 12 6	111 12 0	224 5 9	81 17 0	...	...	...
Row	...	488 9 0	565 16 0	1,374 17 4	282 3 6	181 2 4	...	91 0 9
Total of Dumbarton	10,450 7 9	1,620 6 5	9,504 12 0	21,618 11 11	4,147 12 0	2,518 15 6	2,517 8 7	525 7 2

*No School under the Board.

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	100 0 0	1/0½	585 0 0	...	...	12 16 6	814 7 0	...	2,482
...	300 0 0	1/0$\frac{3}{10}$	...	...	...	0 4 6	573 3 0	9 9 8	7,181
...	130 0 0	5	...	...	23 7 10	9 2 0	481 11 10	318 12 0	6,346
...	200 0 0	9½	...	...	...	0 18 9	403 19 8	71 0 9	5,855
80 0 0	9,166 5 6	...	585 0 0	1 8 6	30 4 10	75 8 1	22,076 16 4	935 14 0	276,018
...	455 15 0	5½	...	...	...	...	937 18 6	45 1 4	20,861
30 0 0	850 0 0	1/2$\frac{3}{4}$	...	...	...	2 11 0	1,628 15 9	10 3 1	14,345
45 0 0	900 0 0	1/9$\frac{3}{4}$	...	...	76 13 3	14 17 6	1,925 4 11	...	11,554
6 0 0	375 0 0	9	...	...	...	7 1 6	792 11 4	...	10,180
1 0 0	250 0 0	3½	...	...	...	...	600 9 0	...	16,628
300 0 0	2,350 0 0	8	...	112 17 7	...	*42 0 6	5,963 10 8	371 0 8	72,418
382 0 0	5,180 15 0	...	...	112 17 7	76 13 3	66 10 6	11,848 10 2	426 5 1	145,986
...	350 0 0	1/3½	...	...	28 1 8	...	1,107 3 11	397 3 5	6,569
...	375 0 0	1/10	...	...	...	0 8 5	1,259 4 1	342 16 4	4,414
...	250 0 0	1/4$\frac{3}{4}$	...	...	...	...	743 12 3	...	3,801
70 0 0	800 0 0	1/3½	...	...	...	3 10 0	2,025 2 5	124 15 0	12,600
60 0 0	145 13 11	1/	...	5 0 0	...	34 2 11	1,208 9 9	...	2,455
90 0 0	872 10 0	1/3¼	...	...	...	†51 19 6	4,228 7 6	...	13,718
60 0 0	300 0 0	1/1	...	...	...	3 0 0	997 13 7	287 3 4	5,473
...	...	...	...	...	105 6 11	...	412 9 8	...	...
...	380 0 0	1/2$\frac{9}{10}$	...	...	...	‡62 2 2	890 1 1	...	6,289
100 0 0	1,300 0 0	1/6$\frac{17}{20}$	...	126 13 11	...	0 2 0	3,920 9 1	...	17,982
...	125 0 0	6$\frac{11}{16}$	...	...	...	4 19 6	1,169 12 1	...	5,872
100 0 0	1,700 0 0	1/4$\frac{1}{4}$	...	...	...	10 10 0	7,583 2 8	1,716 18 6	24,037
...	750 0 0	1/1$\frac{1}{8}$	...	...	...	§153 15 9	1,956 11 10	95 1 0	12,581
480 0 0	7,348 3 11	...	...	131 13 11	133 8 7	324 10 3	27,501 19 11	2,963 17 7	115,791
250 0 0	3,500 0 0	1/4	...	...	...	28 1 2	10,380 2 8	989 1 3	54,444
...	1,600 0 0	1/3	...	...	...	‖317 7 4	4,319 6 0	...	26,935
130 0 0	1,450 0 0	1/6$\frac{5}{8}$	...	...	...	44 13 6	3,804 16 9	62 17 3	19,258
...	650 0 0	¶	...	...	...	23 0 0	1,773 2 3	..	15,592
...	400 0 0	10½	...	0 11 8	...	...	767 0 5	66 12 10	10,729
40 0 0	900 0 0	1/4½	...	...	...	5 8 6	3,108 0 5	165 1 7	14,156
420 0 0	8,500 0 0	...	...	0 11 8	...	418 10 6	24,152 8 6	1,283 12 11	141,114
...	235 3 3	6½	...	...	...	...	576 17 2	...	8,486
347 16 0	1,900 0 0	8½	...	...	...	34 11 6	7,963 5 0	155 0 1	58,778
...	1,800 0 0	1/3	...	3 16 5	...	19 4 4	3,686 15 10	161 15 2	31,133
...	1,428 10 2	1/6	185 0 0	...	...	5 9 6	3,161 15 7	354 5 1	20,456
448 1 0	4,694 11 0	1/2½	1,300 0 0	315 6 0	14 10 7	121 11 8	14,135 19 10	...	79,530
...	34 11 9	1½	...	...	...	...	88 1 5	...	4,251
...	275 0 0	7½	3,000 0 0	...	...	3 17 3	3,532 11 ⁰	214 2 8	8,934
...	1,800 0 0	**	...	...	...	38 14 5	5,778 1 10	5 13 6	34,500
391 12 6	...	...	...	...	872 16 8	27 10 0	2,105 11 2	665 15 0	...
...	1,000 0 0	††	...	...	...	2 10 0	1,870 18 7	772 8 3	29,061
...	...	...	...	...	192 0 0	...	599 12 10	211 15 11	...
...	250 0 0	10	...	...	72 17 4	...	625 9 1	...	5,887
248 2 0	4,600 0 0	10½	3,000 0 0	...	...	‡‡67 16 8	13,828 11 11	...	117,105
387 10 0	12,800 0 0	1/7$\frac{3}{10}$	26,350 0 0	...	...	224 9 9	60,036 8 2	...	165,840
...	600 0 0	8	...	...	...	...	1,022 7 3	...	18,012
331 0 0	4,100 0 0	11½	...	30 17 6	...	28 3 5	7,473 9 1	...	103,292
2,153 15 6	35,517 16 2	...	33,835 0 0	349 19 11	1,151 4 7	573 18 6	126,485 16 0	2,540 15 8	685,265

* Rents, £29 7s. 6d. † From Duke of Portland, £27 9s. ‡ From Farr, under Boundary Award, £61 2s. 6d. From Wick Burgh, under Department Award. ‖ From Alloa Burgh, under Boundary Award, £302 7s. 4d.
¶ Owners, 4¼d.; Occupiers, 8$\frac{3}{20}$d., 2$\frac{3}{4}$d., 2$\frac{3}{10}$d. ** Owners, 6¼d ; Occupiers, 1/2, 8$\frac{3}{4}$d , 7d., 5½d., 2d.
†† Owners, 4¼d. ; Occupiers, 10d , 5d., 3¾d., 1½d. ‡‡ Rents, £34 7s.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
DUMFRIES								
Annan (including B.)	..	204 14 11	718 16 0	1,573 1 3	269 11 0	80 8 11	...	...
Applegarth and Sibbaldie	40 5 2	...	63 12 0	122 7 6	23 17 0	...	...	...
Brydekirk	36 17 9	16 3 6	81 0 0	161 6 6	50 7 6	...	...	...
Caerlaverock	61 10 8	...	97 4 0	203 6 7	116 9 0	...	...	...
Canonbie	...	...	187 4 0	348 11 6	70 4 0	...	...	...
Closeburn	...	...	27 0 0	62 15 9	10 2 6	...	...	...
Cummertrees	...	...	63 12 0	134 2 6	53 17 0	...	...	...
Dalton	42 10 2	...	43 4 0	77 8 0	16 4 0	...	...	...
Dornock	...	...	79 4 0	143 9 6	29 14 0	...	...	...
Dryfesdale	...	...	343 4 0	975 7 4	128 14 0	63 11 1	...	...
Dumfries (B.)	...	153 17 3	840 0 0	1,660 19 2	315 0 0	314 14 1	...	...
Dumfries (L.)	...	77 7 0	447 12 0	890 13 3	167 17 0	6 8 3	76 10 8	...
Dunscore	35 15 9	...	97 4 0	183 14 0	36 9 0	...	...	...
Durisdeer	...	...	66 12 0	134 6 3	24 19 6	...	...	...
Eskdalemuir	47 16 2	...	27 0 0	77 10 9	10 2 6	...	...	...
Ewes	8 4 3	...	21 0 0	51 10 0	7 17 6	...	...	...
Glencairn	...	...	129 0 0	275 18 9	118 7 6	...	...	...
Gretna	...	...	100 16 0	180 1 6	37 16 0	..	...	...
Halfmorton	7 10 5	...	22 16 0	50 16 9	48 11 0	...	...	...
Hoddam	...	...	116 8 0	211 3 0	43 13 0	...	...	...
Holywood	51 18 0	...	97 16 0	200 12 0	36 13 6	...	...	...
Hutton and Corrie	...	...	72 12 0	161 8 0	77 4 6	...	...	...
Johnston	...	...	66 12 0	146 0 0	24 19 6	...	...	...
Keir	...	...	42 0 0	87 5 0	93 5 0	..	...	...
Kirkconnel	18 5 0	...	138 0 0	261 16 6	51 15 0	...	...	...
Kirkmahoe	...	...	103 16 0	180 3 9	118 18 6	...	...	...
Kirkmichael	25 6 5	...	74 8 0	150 13 9	27 18 0	...	...	...
Kirkpatrick-Fleming	...	...	144 0 0	267 15 9	94 0 0	12 4 3	...	...
Kirkpatrick-Juxta	...	...	75 0 0	152 9 0	68 2 6	...	...	...
Langholm	...	70 8 7	312 0 0	883 17 9	117 0 0	...	84 0 8	...
Lochmaben (including B.)	...	...	257 8 0	480 10 3	96 16 6	...	...	...
Middlebie	...	0 2 8	182 8 0	275 3 3	96 0 6	...	...	...
Moffat	71 19 8	...	234 12 0	560 11 10	87 19 6	...	...	...
Morton	...	...	144 0 0	270 1 4	94 0 0	...	...	...
Mouswald	...	...	43 16 0	79 6 6	16 8 6	...	...	...
Penpont	43 2 11	...	68 8 0	141 8 3	65 13 0	...	...	...
Ruthwell	...	...	51 12 0	94 9 9	19 7 6	...	...	...
St. Mungo	58 16 8	...	49 4 0	89 5 6	18 9 0	...	...	...
Sanquhar (including B.)	...	...	220 4 0	447 11 6	82 11 6	38 19 7	...	...
Tinwald	157 2 0	...	72 12 0	135 8 3	27 4 6	...	...	...
Torthorwald	53 18 9	5 18 1	93 0 0	174 19 3	34 17 6	...	...	..
Tundergarth	...	...	43 16 0	91 5 6	16 8 6	...	...	...
Tynron	...	...	28 4 0	78 18 9	10 11 6	...	...	...
Wamphray	2 12 2	...	22 16 0	49 16 0	48 11 0	...	...	...
Westerkirk	...	...	37 16 0	100 7 9	54 3 6	...	...	...
Total of Dumfries	763 11 11	528 12 0	6,248 8 0	13,079 15 0	3,058 5 6	516 6 2	160 11 4	...
EDINBURGH.								
Borthwick	...	3 7 5	73 4 0	267 13 9	26 2 0	10 2 8	...	...
Carrington	127 16 11	...	26 8 0	49 7 3	59 18 0	...	...	...
Cockpen	...	0 19 6	211 16 0	412 6 9	119 8 6	16 2 11	..	...
Colinton	...	...	466 16 0	1,010 5 5	265 1 0	...	...	...
Corstorphine	59 16 3	...	193 16 0	376 6 9	72 13 6	19 9 7	...	...
Cramond	...	...	255 12 0	465 0 6	175 17 0	...	...	...

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
164 14 4	1,860 0 0	1/1	...	99 4 0	...	1 2 0	4,971 12 5	135 4 2	36,013
...	220 0 0	5½	...	...	...	...	470 1 8	...	10,434
...	141 10 5	8	...	...	...	3 4 1	490 9 9	...	4,420
...	190 0 0	6¾	...	250 0 0	...	*28 0 0	946 10 3	...	7,024
...	480 0 0	9¼	...	...	...	...	1,085 19 6	395 9 4	12,067
...	310 0 0	5¾	...	...	16 18 9	†42 1 5	468 18 5	...	13,390
...	458 2 4	1/1 7/10	...	...	...	14 9 6	724 3 4	...	9,090
...	110 0 0	5	460 0 0	...	...	...	749 6 2	1 4 7	5,264
...	200 0 0	8	...	...	...	2 15 0	455 2 6	...	5,805
170 16 7	1,250 0 0	1/4	...	...	...	5 0 0	2,936 13 0	51 4 8	20,342
...	3,830 0 0	1/4	...	...	...	...	7,114 10 6	...	61,345
...	1,237 17 4	1/1	...	...	...	5 14 8	2,910 0 2	42 6 10	23 601
...	287 10 10	7	...	19 15 6	...	...	660 9 1	4 6 10	9,815
...	280 0 0	8½	500 0 0	2 6 0	...	3 11 2	1,011 14 11	...	8,219
...	220 0 0	7⅞	...	...	...	...	382 9 5	...	8,350
...	160 0 0	8¾	...	...	...	...	248 11 9	0 8 2	4,492
...	390 0 0	6½	...	...	20 1 11	0 10 0	933 18 2	23 10 10	13,629
...	400 0 0	9⅞	...	...	...	...	718 13 6	178 19 9	9,588
...	140 0 0	9	...	...	...	0 2 6	269 16 8	...	4,048
...	325 0 0	10	...	...	...	3 18 4	700 2 4	42 7 0	9,960
...	300 0 0	7½	...	...	...	3 13 10	690 13 4	...	9,193
...	350 0 0	8¼	510 0 0	...	...	2 5 1	1,173 9 7	81 18 0	9,527
...	250 0 0	9	...	...	...	...	487 11 6	35 5 11	6,304
...	180 0 0	5⅝	...	...	...	7 3 5	409 13 5	...	4,720
...	400 0 0	10⅜	1,500 0 0	...	10 0 0	12 8 5	2,392 4 11	...	11,161
...	340 0 0	7	...	...	...	2 10 10	745 9 1	...	11,799
...	210 0 0	6 9/16	...	...	...	...	488 6 2	...	8,260
...	480 0 0	1/-	...	4 0 0	...	0 10 0	1,002 10 0	55 14 5	10,404
...	350 0 0	8	...	...	...	...	645 11 6	18 12 10	11,192
128 4 4	870 0 0	1/3¼	...	...	...	3 18 4	2,469 9 8	...	14.165
...	625 0 0	10 9/10	...	...	...	3 19 8	1,463 8 5	...	14,119
...	525 0 0	11½	...	...	...	0 5 6	1,078 19 11	...	13,132
64 4 10	900 0 0	9¼	...	54 17 6	12 14 7	...	1,986 19 11	6 11 7	24,213
...	300 0 0	5	...	...	...	2 13 4	810 14 8	95 18 6	10,206
...	165 5 7	8	...	...	...	...	304 16 7	...	5,043
...	310 0 0	11	...	2 17 1	...	...	631 9 3	...	7,736
...	162 15 4	6	...	...	...	8 0 0	336 4 1	62 18 7	6,140
...	160 0 0	5	...	...	...	2 2 6	377 17 8	...	5,861
...	850 0 0	1/2	...	54 12 4	...	19 10 2	1,713 9 1	109 16 1	14,136
...	134 18 6	3	...	...	...	2 6 6	529 11 9	..	9,024
...	250 0 0	10	...	...	...	...	612 13 7	25 12 4	6,102
...	153 0 0	6½	...	...	...	...	304 10 0	...	6,003
...	120 0 0	5 3/10	...	63 1 6	...	9 0 0	309 15 9	...	4,586
...	110 0 0	4¾	...	18 0 0	...	...	251 15 2	...	5,463
...	120 0 0	5¼	...	...	...	...	312 7 3	16 17 3	5,391
528 0 1	21,106 0 4	...	2,970 0 0	568 13 11	60 15 3	190 16 8	49,778 15 9	1,384 7 8	510,776
...	220 0 0	4 1/10	...	...	...	0 8 6	600 18 4	...	12,438
...	120 0 0	3¼	...	...	...	...	383 10 2	...	2,078
...	600 0 0	6¾	620 0 0	...	...	3 14 9	1,984 8 5	...	20,403
70 0 0	1,950 0 0	11⅜	1,150 0 0	...	28 0 0	‡35 16 11	4,975 19 4	...	42,460
...	700 0 0	5⅝	1,350 0 0	...	...	14 12 0	2,786 14 1	...	30,947
...	1,000 0 0	7	2,225 0 0	...	...	§38 10 1	4,159 19 7	...	33,913

From Hutton Trust. † Rents. ‡ Rents, £34 17s. 11d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
EDINBURGH—*contd.*								
Cranston	...	...	100 16 0	184 11 9	40 14 6	...	...	...
Crichton	...	...	69 0 0	256 16 3	25 17 6	...	...	...
Currie	68 18 1	...	195 0 0	372 4 9	113 2 6	...	...	...
Dalkeith (B.)	...	...	402 12 0	837 5 6	150 19 6	...	...	...
Dalkeith (L.)	112 12 9	...	91 4 0	191 14 0	34 4 0	...	...	...
Edinburgh (City)	23,472 18 11	325 8 8	20,154 14 0	46,393 3 1	7,544 0 10	5,277 7 9	...	...
Fala and Soutra	...	...	28 4 0	106 6 0	10 11 6	...	...	...
Glencorse	20 6 2	...	123 12 0	239 7 3	46 7 0	...	...	...
Heriot	52 2 5	9 5 0	30 0 0	64 18 9	51 5 0	...	...	...
Inveresk (L.)	961 15 2	...	361 16 0	654 14 3	175 13 6	...	...	...
Kirknewton and East Calder.	...	37 13 8	306 12 0	599 17 3	154 19 6	17 7 1	29 13 3	...
Lasswade	147 15 5	4 0 0	906 12 0	1,999 13 7	359 19 6	114 13 3	214 11 6	...
Leith (B.)	...	2,274 11 7	6,448 4 0	14,674 2 5	2,418 1 6	2,602 18 6	863 5 7	200 0 0
Liberton	...	0 5 7	699 4 0	1,318 13 6	312 12 9	9 3 7	...	...
Mid-Calder	...	37 12 2	396 0 0	802 13 3	195 7 0	33 5 3	152 5 11	...
Musselburgh (B.)	114 14 4	164 9 0	1,072 4 0	2,231 5 2	402 1 6	17 9 3	306 18 2	30 0 0
Newbattle	...	...	445 4 0	865 8 3	166 19 0	26 11 10	197 1 7	...
Newton	16 16 7	...	144 0 0	319 1 9	86 1 8	...	...	...
Penicuik	...	...	389 8 0	896 19 0	146 0 6	...	51 0 0	...
Ninemileburn (Comb.)	...	...	17 8 0	47 1 6	6 10 6	...	...	...
Ratho	...	...	88 16 0	166 14 3	53 6 0	...	...	...
Stobhill	99 13 3	11 12 1	366 12 0	721 4 9	137 9 6	8 17 0	99 17 5	...
Stow	41 16 2	...	111 12 0	233 13 9	121 17 0	...	...	...
Temple	73 8 7	...	35 8 0	63 18 6	63 5 6	...	...	...
West Calder	126 16 4	3 17 0	744 12 0	1,638 6 9	409 4 6	22 5 5	676 4 2	29 4 5
Total of Edinburgh	25,447 7 4	2,873 1 8	34,956 6 0	78,460 15 8	13,945 11 9	8,175 14 1	2,590 17 7	259 4 5
ELGIN.								
Alves	...	...	78 12 0	336 6 4	34 4 0	...	...	...
Bellie	5 2 0	5 11 5	75 4 0	157 3 0	28 11 6	20 4 1	...	...
Birnie	...	...	40 16 0	92 4 6	16 8 6	...	...	...
Cromdale	...	...	312 0 0	834 15 1	217 4 6	...	15 9 3	28 0 0
Dallas	...	...	66 0 0	151 0 3	64 15 0	...	...	...
Drainie	...	...	485 8 0	1,061 9 2	282 9 6	...	167 3 7	...
Duffus	...	...	447 12 0	1,028 19 0	197 17 0	...	255 10 10	...
Dyke	9 19 4	...	93 12 0	439 7 5	59 17 0	...	...	...
Edinkillie	...	...	21 0 0	150 3 3	8 11 0	...	...	...
Elgin (B.)	...	13 17 6	781 16 0	1,689 19 9	293 3 6	132 0 11	316 12 3	40 0 0
Elgin (L.)	481 16 8	...	298 4 0	589 2 5	111 16 6	27 18 9	111 11 2	...
Forres (B.)	...	...	377 8 0	943 6 11	141 10 6	63 12 1	166 18 5	57 17 0
Forres (L.)	121 15 1	...	* ...	...	...	...	...	...
Kinloss	...	...	99 12 0	462 19 9	83 13 0	25 16 9	22 2 7	...
Knockando	...	9 2 7	151 16 0	308 6 9	116 18 6	...	...	...
New Spynie	...	...	22 4 0	80 2 7	109 18 0	...	...	...
Rafford	...	...	75 12 0	246 19 3	40 4 0	...	...	...
Rothes	...	...	252 0 0	771 3 9	199 11 0	24 12 1	138 0 4	14 2 2
St. Andrews-Lhanbryde	...	...	79 4 0	331 16 3	29 14 0	...	...	...
Cranloch (Comb.)	...	...	18 12 0	101 1 0	6 19 6	...	...	...
Speymouth	16 10 5	...	141 0 0	296 9 3	122 17 6	...	...	...
Urquhart	57 15 5	...	60 0 0	146 2 8	62 10 0	...	...	...
Total of Elgin.	692 18 11	28 11 6	3,978 12 0	10,208 18 4	2,228 14 0	294 4 8	1,193 8 5	139 19 2

* No School under the Board.

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	120 0 0	4	...	...	...	...	446 2 3	110 11 5	6,102
...	290 0 0	1/1½	...	...	...	2 5 0	643 18 9	..	5,777
...	750 0 0	8	...	...	...	9 19 7	1,509 4 11	...	24,743
69 19 2	1,750 0 0	1/2½	...	...	...	21 8 8	3,232 4 10	116 8 1	28,998
...	225 0 0	8½	...	...	...	...	654 14 9	...	6,696
1,735 0 0	122,500 0 0	1/0$\frac{7}{8}$	...	24 0 0	14 0 0	*1,101 13 4	228,542 6 7	...	2,450,398
...	110 0 0	9½	...	3 9 1	...	...	258 10 7	...	2,791
...	330 0 0	7½	...	...	...	0 4 6	759 16 11	16 3 1	11,369
...	120 0 0	5½	...	...	...	...	327 11 2	...	5,602
...	950 0 0	8½	...	...	...	20 10 2	3,124 9 1	169 3 9	29,545
...	900 0 0	1/0½	400 0 0	...	22 18 0	21 6 0	2,490 6 9	...	19,980
70 0 0	2,400 0 0	†	...	...	...	14 16 10	6,232 2 1	...	48,536
752 0 0	31,046 0 0	1/5¾	21,945 0 0	...	...	‡452 4 7	83,676 8 2	...	440,415
...	2,000 0 0	8½	...	...	...	§51 1 3	4,391 0 8	44 6 11	65,202
...	1,200 0 0	1/4	...	...	...	11 8 6	2,828 12 1	...	18,854
70 0 0	2,100 0 0	10	1,000 0 0	51 10 0	...	34 15 6	7,595 6 11	..	52,026
...	875 0 0	1/4$\frac{7}{16}$	3,600 0 0	...	...	12 0 11	6,188 5 7	...	13,248
...	390 0 0		2,000 0 0	5 0 0	...	0 17 1	2,961 17 1	...	13,657
99 3 4	1,500 0 0	1/	...	...	...	9 4 8	3,091 15 6	56 16 0	32,167
...	...	...	...	...	76 2 7	...	147 2 7	...	...
...	425 0 0	5½	...	...	...	27 16 3	761 12 6	61 16 3	17,927
...	512 14 11	9	...	...	...	...	1,958 0 11	...	13,684
...	460 0 0	8	...	...	10 0 0	12 4 6	991 3 5	7 8 11	14,756
...	120 0 0	2½	...	...	...	1 9 6	307 10 1	...	11,471
70 0 0	2,675 0 0	1/7	...	...	...	5 6 6	6,400 17 1	...	36,608
2,936 2 6	178,338 14 11	...	34,290 0 0	83 19 1	151 0 7	1,903 15 7	384,412 11 2	582 14 5	3,520,291
15 9 6	350 0 0	1/1¾	...	23 18 8	...	8 2 0	846 12 6	311 12 1	7,445
...	250 0 0	10½	...	65 11 9	...	6 6 1	614 13 10	37 19 3	6,902
13 0 0	140 0 0	10½	...	53 6 4	...	0 10 0	356 5 4	21 18 6	3,048
74 0 0	950 0 0	1/0½	...	15 0 0	41 17 8	64 11 9	2,552 18 3	500 11 2	19,062
20 0 0	300 0 0	1/4	...	23 18 8	...	1 0 0	626 13 11	224 19 10	4,785
41 2 0	500 0 0	9¾	500 0 0	34 0 2	...	2 7 5	3,073 19 10	297 13 4	13,429
...	750 0 0	1/0½	...	26 8 1	...	...	2,706 6 11	...	11,660
20 0 0	300 0 0	10	...	25 0 5	...	1 5 0	949 1 2	...	7,535
8 9 3	275 0 0	1/0½	...	...	...	1 0 0	464 3 6	...	5,970
...	2,089 3 7	1/3	100 0 0	1 2 6	...	¶905 10 0	6,363 6 0	4 5 9	34,666
21 3 2	800 0 0	1/2	...	26 7 0	7 2 5	8 0 1	2,483 2 2	...	14,241
57 0 0	1,300 0 0	1/8¼	...	242 10 9	153 12 4	30 14 6	3,534 10 6	209 4 3	17,213
...	160 0 0	6¾	...	...	...	...	281 15 1	...	7,943
10 0 0	400 0 0	1/3¾	350 0 0	...	...	6 5 0	1,460 9 1	156 12 2	6,769
20 0 0	550 0 0	11½	...	26 4 2	...	5 6 6	1,187 14 6	339 6 10	11,762
10 0 0	100 0 0	4½	...	...	...	2 5 0	324 9 7	...	4,574
10 0 0	300 0 0	10½	265 0 0	20 19 0	25 0 0	5 1 0	988 15 3	124 5 3	7,177
31 8 5	750 0 0	**	...	34 0 2	...	††116 15 0	2,331 12 11	168 4 5	11,864
17 0 8	400 0 0	††	...	38 8 1	21 1 6	...	917 4 6	...	7,645
...	...	...	...	...	134 0 7	...	260 13 1	143 12 3	...
10 12 6	380 16 5	1/0⅛	...	19 17 9	...	...	988 3 10	...	7,966
9 14 0	250 0 0	10¼	...	47 5 1	...	...	623 7 2	...	5,778
388 19 6	11,295 0 0	...	1,215 0 0	723 18 7	382 14 6	1,164 19 4	33,935 13 11	2,540 5 1	217,434

* Income Day Industrial School, £582 17s. 9d.; Rents, £100. † Owners, 5½$\frac{3}{8}$d.; Occupiers, 6$\frac{5}{10}$d., 2d.
‡ From Bell Trust, £200. § From Edinburgh under Adjustment Order, £35. ‖ Owners, 3$\frac{7}{8}$d.$\frac{5}{8}$; Occupiers, 5$\frac{5}{8}$d., 3$\frac{7}{8}$d., 1$\frac{4}{7}$d.
¶ Price of Property sold, £750. ** Owners, 7½d.; Occupiers, 3½d., 7⅝d., 10⅝d., 5d. †† From Grant Trust, £40.
‡‡ Owners, 6d.; Occupiers, 3d., 9d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
FIFE.								
Abdie	...	...	28 16 0	109 14 6	90 16 0	...	...	...
Aberdour	64 7 9	...	174 12 0	339 19 9	65 9 6	32 1 11	...	...
Anstruther-Easter	6 7 4	...	154 4 0	310 9 0	57 16 6	...	66 17 7	...
Anstruther-Wester	...	...	31 4 0	65 18 6	51 14 0	...	...	...
Auchterderran	...	14 16 2	665 8 0	2,638 10 7	235 7 0	46 5 7	160 17 10	30 0 0
Auchtermuchty	205 1 6	...	179 8 0	381 6 4	67 5 6	35 4 3	...	15 0 0
Auchtertool	...	5 5 1	93 12 0	130 6 3	27 0 0	5 2 8	...	...
Ballingry	174 14 7	2 0 6	253 4 0	480 7 9	94 19 0	...	...	...
Balmerino	...	...	58 16 0	118 2 0	62 1 0	...	...	...
Beath	...	5 7 0	2,359 16 0	8,873 19 9	1,363 5 6	145 5 11	1,657 11 3	20 0 0
Burntisland (B.)	...	20 8 6	356 8 0	925 1 6	133 13 0	116 6 7	...	60 0 0
Burntisland (L.)	62 9 0	...	*...	...	...	...	...	...
Cameron	...	...	69 0 0	135 17 3	65 17 6	...	...	...
Carnbee	...	...	65 8 0	117 4 9	64 10 6	...	...	...
Carnock	338 16 8	...	109 4 0	197 1 0	90 19 0	...	19 6 6	...
Ceres	...	...	131 8 0	267 4 5	49 5 6	...	...	...
Collessie	...	...	201 12 0	766 17 6	115 12 0	12 13 10	...	10 6 6
Crail	21 10 0	...	136 4 0	263 8 4	51 1 6	...	...	...
Creich	...	...	31 16 0	57 15 0	61 18 6	...	...	...
Culross	250 16 10	...	75 0 0	146 17 3	48 2 6	...	...	...
Cults	5 7 5	...	66 0 0	124 7 0	24 15 0	...	...	...
Cupar (B.)	...	...	429 0 0	956 13 11	160 17 6	8 18 1	...	...
Cupar (L.)	4 12 11	...	11 8 0	19 10 9	4 5 6	...	...	...
Dairsie	...	0 14 6	54 0 0	116 2 0	60 5 0	...	...	...
Dalgety	...	0 7 0	158 8 0	318 1 0	99 8 0	12 18 2	51 19 4	3 0 0
Dunbog	...	1 0 0	29 8 0	63 2 6	51 0 6	...	...	...
Dunfermline (B.)	207 15 0	451 17 1	2,044 16 0	4,426 19 4	766 16 0	1,104 16 11	987 6 7	200 0 0
Dunfermline (L.)	387 10 4	1 0 6	854 8 0	1,726 18 3	480 8 0	26 15 9	272 14 11	13 15 0
Dunino	...	...	38 8 0	74 6 0	59 8 0	...	...	...
Dysart (B.)	...	14 15 0	1,517 8 0	3,009 11 4	569 0 6	398 0 9	477 14 0	70 0 0
Elie	..	...	93 0 0	367 10 9	114 13 0	...	...	...
Falkland	...	28 5 0	205 4 0	658 12 10	76 19 0	6 10 10	...	14 10 0
Ferry-Port-on-Craig	...	...	312 0 0	803 15 11	117 4 0	...	131 3 3	...
Flisk	...	0 10 3	30 0 0	78 16 6	51 5 0	...	...	...
Forgan	...	12 3 0	291 12 0	695 4 2	179 7 0	36 12 6	...	8 8 4
Inverkeithing	838 16 4	12 8 10	350 8 0	688 7 11	161 8 0	56 7 8	...	8 0 0
Kemback	1 12 10	...	42 0 0	76 13 9	55 15 0	...	...	...
Kennoway	...	2 5 6	151 16 0	369 11 6	156 18 6	...	50 3 4	...
Kettle	148 1 2	3 1 10	121 4 0	283 3 6	45 9 0	...	...	...
Kilconquhar	...	...	117 12 0	347 5 9	82 6 0	17 18 11	...	8 0 0
Kilmany	2 12 5	...	38 8 0	64 10 0	14 8 0	...	...	...
Kilrenny	...	...	346 4 0	740 18 4	169 16 6	...	166 15 9	...
Kinghorn (including B.)	25 13 2	...	190 16 0	432 11 2	71 11 0	27 15 7	...	9 15 11
Kinglassie	116 10 11	...	94 16 0	197 1 9	35 11 0	...	...	...
Kingsbarns	94 1 8	...	73 4 0	143 18 0	27 9 0	...	...	...
Kirkcaldy (B.)	1,049 16 5	542 3 4	1,994 8 0	4,179 5 0	747 18 0	991 4 4	708 15 10	140 0 0
Kirkcaldy and Dysart (L)	...	...	199 4 0	486 17 0	114 14 0	8 17 3	...	4 10 0
Largo	...	...	146 8 0	569 5 3	95 11 6	...	...	...
Largoward	...	...	77 8 0	179 9 5	109 0 6	...	...	...
Leslie	229 9 9	18 4 3	414 12 0	847 4 5	155 9 6	29 2 9	60 19 4	5 0 0
Leuchars	8 18 1	0 11 4	247 4 0	485 15 1	92 14 0	...	...	...
Lochgelly	...	3 12 9	1,252 16 0	4,110 12 0	673 10 0	114 2 11	2,542 5 1	16 0 0
Logie	...	...	22 4 0	52 14 0	48 6 6	...	...	...
Markinch	175 13 4	91 5 11	703 4 0	1,484 4 4	343 14 0	...	212 16 5	...
Monimail	42 9 0	...	46 16 0	84 7 0	67 11 0	...	...	...

* No school under the Board.

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	70 17 10	2	...	...	...	...	300 4 4	...	6,363
...	615 0 0	7 7/12	...	...	...	6 19 6	1,298 10 5	...	17,777
...	293 19 10	1/2	...	10 0 0	...	9 9 3	909 3 6	...	5,163
...	75 0 0	5	...	4 15 0	...	3 5 0	231 16 6	0 5 3	3,480
...	1,500 0 0	10 3/4	1,700 0 0	...	...	16 5 2	7,007 10 4	152 11 6	35,140
...	400 0 0	10 7/8	...	...	...	16 11 0	1,299 16 7	32 6 4	8,505
...	270 0 0	7 3/4	...	...	1 2 0	1 14 6	534 2 6	...	8,814
...	1,000 0 0	1/2 3/4	...	...	...	2 5 2	2,007 11 0	43 18 6	16,926
...	153 14 6	7	...	...	...	7 14 6	400 8 0	24 17 0	5,283
...	4,200 0 0	*	...	...	62 16 1	24 8 7	18,712 10 1	..	61,004
185 0 0	1,303 0 3	1/1 1/5	...	38 10 0	110 0 0	20 15 5	3,269 3 3	...	26,660
...	241 5 0	8 1/2	...	...	...	0 9 9	304 3 9	...	7,362
...	200 0 0	6 1/2	...	...	48 1 2	0 8 8	519 4 7	61 13 11	6,842
...	320 0 0	7 1/16	...	25 15 9	...	0 10 0	593 9 0	...	10,008
...	240 0 0	10 1/4	...	0 5 7	...	6 1 9	1,001 14 6	...	5,568
...	350 0 0	8 3/4	...	6 13 9	40 19 0	8 0 0	853 10 8	161 8 3	10,390
...	500 0 0	9 1/4	...	...	...	...	§1,607 1 10	111 9 1	13,352
...	350 0 0	6 3/4	...	21 0 0	...	...	843 3 10	...	12,293
...	87 15 0	8	...	1 18 11	...	...	241 3 5	9 15 9	2,371
...	350 0 0	9 1/2	...	40 0 0	...	22 10 7	933 7 2	...	9,302
...	180 0 0	10	...	...	...	...	400 9 5	2 1 1	4,646
...	950 0 0	10 9/10	...	...	...	21 5 3	2,526 14 9	...	20,322
...	105 0 0	2 9/10	...	...	...	...	144 17 2	...	8,033
...	110 0 0	5 1/4	...	...	...	10 7 4	351 8 10	15 18 7	4,458
...	230 0 0	9	...	...	...	...	874 1 6	2 17 4	6,238
...	93 9 8	4 7/12	300 0 0	...	...	...	538 0 8	...	3,462
...	4,900 0 0	1/3	...	5 2 8	167 18 6	†2,198 7 10	17,461 15 11	217 9 4	78,965
...	2,800 0 0	1/3	...	...	...	14 18 5	6,578 9 2	...	48,061
...	90 0 0	8 1/2	...	...	5 5 0	...	267 7 0	...	2,770
...	2,010 4 1	9	...	50 0 0	...	‡94 19 4	8,211 13 0	1,096 19 11	54,942
...	230 0 0	3 1/2	...	6 0 4	...	...	811 4 1	...	12,834
25 0 0	350 0 0	6	...	...	...	21 10 1	1,386 11 9	...	12,231
115 0 0	580 0 0	8	...	...	...	17 12 6	2,076 15 8	281 7 4	12,866
...	90 0 0	8 1/2	...	...	...	...	250 11 9	20 10 7	2,559
185 0 0	1,800 0 0	1/2 1/2	...	...	...	3 15 0	3,212 2 0	417 11 1	31,408
...	1,000 0 0	‖	...	3 16 0	...	30 15 9	3,150 8 6	...	55,125
...	116 8 5	8 1/2	...	...	...	...	292 10 0	...	3,589
...	400 0 0	1/1 1/4	...	1 13 4	...	6 19 0	1,139 7 2	229 2 2	7,324
...	450 0 0	¶	...	4 10 0	...	...	1,055 9 6	...	10,452
...	200 0 0	4 3/8	...	...	...	**44 17 6	818 0 2	...	8,014
...	130 0 0	4 3/4	...	...	...	...	249 18 5	...	6,167
...	500 0 0	1/1	...	...	...	3 6 1	1,927 0 8	72 8 2	9,848
...	640 4 4	††	...	...	...	22 14 5	1,421 1 7	...	16,087
...	301 5 4	5 1/4	...	...	...	0 8 10	745 13 10	...	13,141
...	120 0 0	3	...	...	...	1 7 4	460 0 0	...	5,705
...	6,297 10 5	1/4 3/4	6,000 0 0	...	21 5 0	‡‡218 15 8	22,891 2 0	...	92,380
...	715 9 9	1/1 1/2	...	...	...	9 2 5	1,538 14 5	...	14,110
...	637 1 4	8 1 1/8	...	10 0 0	...	...	1,458 6 1	...	18,010
...	190 19 6	7 5/8	...	...	16 2 0	0 1 6	573 0 11	...	5,752
25 0 0	700 0 0	10 1/4	...	...	25 0 0	14 6 5	2,524 8 5	259 2 7	17,392
...	650 0 0	§§	...	...	...	...	1,485 2 6	...	20,328
...	2,843 14 9	2/0 1/2	1,250 0 0	...	...	54 5 8	12,860 19 2	...	28,640
...	140 0 0	11 1/2	...	2 15 6	...	...	266 0 0	24 10 8	3,785
95 0 0	2,400 0 0	1/2 1/2	2,000 0 0	...	...	22 3 6	7,528 1 6	...	41,262
...	300 0 0	10 1/2	...	...	...	2 15 2	543 18 2	...	6,985

* Owners, 8¾d.; Occupiers, 9 1/16d, 6⅝d., 3 1/16d. † Price of Property sold, £1,843 6s. 11d. ‡ From Philp Trust, £70.
§ Owners, 5½d.; Occupiers, 6⅝d., 1⅝d., 3 5/16d. ‖ Owners, 2d ; Occupiers. 3d., 1½d. ¶ Owners, 4⅜d. ;
Occupiers, 8⅛d., 2⅝d., 4d., 5½d. ** From Elie, under Boundary Award, £44. †† Owners, 4¼d. ; Occupiers, 6½d., 2d.
‡‡ From Philp Trust, £140. §§ Owners, 3¾d.; Occupiers, 5d., 2½d , 1¼d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Fife—*contd.*								
Moonzie	7 5 0	...	24 0 0	56 0 0	9 0 0	...	...	...
Newburgh	162 19 10	4 5 0	197 8 0	455 6 10	74 0 6	23 11 1	58 2 11	22 10 0
Newburn	18 15 10	...	21 12 0	38 14 0	8 6 6	...	...	...
Pittenweem	22 11 10	0 3 0	209 8 0	411 17 3	78 10 6	...	58 2 7	...
St. Andrews (B.)	...	6 6 5	541 4 0	1,087 6 10	232 19 0	32 1 11	...	10 0 0
St. Andrews (L.) & St. Leonards	38 17 11	1 10 0	132 0 0	248 15 9	119 10 0	4 12 0	...	2 10 0
St. Monance	...	1 1 0	205 16 0	772 18 3	76 1 0	16 15 8	114 5 11	...
Saline	...	...	129 12 0	229 12 0	48 12 0	...	...	...
Scoonie	...	0 7 6	461 4 0	1,559 2 7	314 19 0	23 17 4	148 11 2	...
Springfield	70 16 11	...	69 12 0	131 8 3	26 2 0	...	...	...
Strathmiglo	...	8 6 1	162 12 0	360 15 4	90 19 6	41 3 8	...	10 0 0
Torryburn	261 2 4	...	105 0 0	220 4 10	39 7 6	...	...	...
Tullialian	265 18 11	44 8 11	228 12 0	472 12 1	80 11 0	...	77 9 9	...
Wemyss	...	23 9 9	1,954 16 0	3,864 15 6	705 7 6	150 2 0	417 2 3	11 5 0
Total of Fife	5,311 13 0	1,322 1 0	22,383 8 0	55,498 18 4	10,785 13 0	3,525 6 10	8 441 1 7	692 10 9
FORFAR.								
Aberlemno	...	...	44 8 0	152 16 0	116 17 6	...	...	...
Airlie	42 5 5	...	36 12 0	66 6 3	63 14 6	...	...	...
Arbirlot	...	...	48 12 0	95 3 9	58 4 6	...	...	...
Arbroath (B.)	...	183 18 9	1,912 16 0	3,788 17 0	757 6 0	504 9 4	753 11 9	100 0 0
Auchterhouse	...	...	48 12 0	88 9 6	18 4 6	...	...	...
Barry	...	23 11 6	418 16 0	862 10 2	187 1 0	71 4 6	71 18 3	...
Brechin (B.)	250 17 8	108 4 11	796 16 0	1,624 15 7	348 16 0	288 12 8	371 13 11	39 6 11
Brechin (L.)	36 12 6	...	87 12 0	172 15 9	162 17 0	...	...	...
Broughty Ferry (B)	...	696 14 1	991 16 0	2,523 4 9	371 18 6	47 4 9	251 14 9	...
Careston	12 6 6	...	45 0 0	...	18 0 0	...	18 2 4	...
Carmyllie	13 0 5	...	132 0 0	276 2 3	89 10 0	...	...	...
Cortachy and Clova	63 1 5	...	57 0 0	152 13 3	71 7 6	...	...	...
Craig	...	...	229 16 0	511 18 9	168 8 6	...	317 2 6	...
Dun	54 13 2	...	48 12 0	89 7 0	19 7 0	...	...	...
Dundee (B.)	...	4,001 10 6	11,028 12 0	25,722 19 9	4,130 11 0	2,277 12 5	2,871 3 7	...
Dundee (L.)	24 4 10	...	124 4 0	259 9 9	46 11 6	...	...	...
Dunnichen	...	19 6 8	115 4 0	247 4 0	93 4 0	...	24 14 7	...
Eassie and Nevay	...	...	46 4 0	84 6 3	17 6 6	...	...	...
Edzell	...	...	90 12 0	361 10 3	53 10 6	...	...	...
Farnell	25 10 5	...	61 16 0	122 7 0	62 5 6	...	...	...
Fern	...	...	34 4 0	77 3 6	62 16 6	...	...	...
Forfar (B.)	...	126 0 0	1,151 8 0	2,041 12 0	461 15 6	329 1 6	299 18 6	...
Forfar (L.)	...	...	91 16 0	179 0 3	34 8 6	...	...	...
Fowlis Easter	24 11 8	...	31 4 0	65 7 3	61 14 0	...	...	...
Friockheim	48 11 5	...	115 4 0	223 10 6	43 4 0	...	19 15 1	...
Glamis	...	...	87 0 0	164 9 6	52 12 6	...	...	...
Glenisla	118 18 0	...	70 16 0	173 17 0	66 11 0	...	...	...
Guthrie	...	...	35 8 0	74 2 9	53 5 6	...	...	...
Inverarity	...	...	72 0 0	142 13 5	27 0 0	...	...	...
Inverkeillor	39 13 11	...	147 12 0	500 14 9	59 3 6	...	...	...
Kettins	...	...	57 12 0	105 11 3	61 12 0	...	...	...
Kingoldrum	...	...	21 0 0	53 18 3	7 17 6	...	...	...
Kinnell	34 0 5	1 6 1	51 12 0	96 2 0	19 11 6	...	...	...
Kinnettles	..	...	44 8 0	81 3 9	16 13 0	...	...	...
Kirkden	...	2 1 4	22 16 0	52 17 0	58 11 0	4 5 0	...	...
Kirriemuir	...	0 10 0	509 8 0	1,136 14 0	231 0 6	25 5 11	121 12 5	...
Carroch (Comb.)	...	...	16 16 0	45 4 9	...	...	...	...
Roundyhill (Comb.)	...	...	35 8 0	73 18 9	50 0 0	...	...	...
Liff, Benvie, and Invergowrie	59 12 11	...	142 4 0	294 3 6	93 6 6	...	...	...

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	114 6 9	1/4	...	...	...	4 6 2	214 17 11	...	1,699
115 0 0	215 0 0	7	...	...	...	1 19 6	1,330 3 8	...	7,301
...	121 6 10	*	...	...	...	...	208 15 2	...	4,283
...	120 0 0	4	...	35 0 0	...	2 2 11	937 16 1	...	6,007
...	1,220 0 0	†	150 0 0	34 18 1	...	‡459 1 8	3,773 17 11	29 12 2	57,350
...	300 0 0	5/8	...	...	...	0 5 0	848 0 8	93 9 11	20,822
...	290 0 0	1/1½	...	...	...	4 18 10	1,481 16 8	...	5,840
...	180 0 0	3 1/10	...	...	...	15 0 0	602 16 0	...	10,168
115 0 0	1,000 0 0	9⅝	...	...	...	4 0 3	3,627 1 10	826 12 0	27,185
...	95 13 4	4	...	...	...	...	393 12 6	...	5,460
...	433 17 2	10 1/2	...	...	...	1 8 0	1,109 1 9	23 1 8	10,915
...	200 0 0	7½	...	...	...	7 13 2	833 7 10	...	7,324
...	400 0 0	10½	...	16 16 10	...	3 8 0	1,589 17 6	...	9,946
115 0 0	3,451 18 10	9	8,300 0 0	...	...	66 9 4	19,060 6 2	...	92,294
975 0 0	53,914 2 11	...	19,700 0 0	319 11 9	498 8 9	3,532 16 8	186,900 12 7	4,211 0 2	1,227,588
2 0 0	250 0 0	9/20	...	...	...	...	566 1 6	...	7,413
...	130 0 0	3¼	...	0 9 0	...	0 6 11	339 14 1	...	7,810
1 0 0	160 0 0	5 5/16	...	9 1 10	...	0 10 8	372 12 9	6 11 4	7,974
...	4,200 0 0	1/1 1/16	...	...	...	38 17 1	12,239 15 11	1,172 14 9	80,307
0 19 9	310 0 0	9	...	...	...	...	466 5 9	...	9,311
...	1,134 9 6	1/	...	...	...	9 3 10	2,778 14 9	425 19 11	22,097
...	1,800 0 0	1/2	...	7 14 4	...	9 13 0	5,646 11 0	...	31,406
...	380 0 0	7	...	...	...	2 0 9	841 18 0	...	15,339
230 0 0	2,674 15 5	1/1	...	...	...	22 4 1	7,809 12 4	89 14 1	50,303
1 19 9	125 0 0	1/4½	300 0 0	...	...	0 18 11	521 7 6	134 2 1	2,156
2 0 0	270 0 0	9½	...	...	...	...	782 12 8	...	6,202
3 0 0	325 2 5	7	...	...	...	...	672 4 7	...	10,455
...	700 0 0	1/8	...	...	...	...	1,927 5 9	...	9,694
...	150 0 0	5½	...	...	...	...	361 19 2	...	6,299
950 0 0	39,286 0 0	1/2	19,430 0 0	...	...	‖130 8 5	109,828 17 8	...	719,660
...	200 0 0	¶	...	7 12 0	...	1 8 8	663 10 9	...	9,924
4 0 0	190 0 0	8	...	...	...	3 3 0	696 16 3	9 16 7	5,249
...	185 0 0	8⅝	...	...	...	3 0 0	335 16 9	70 2 9	5,950
...	323 17 2	9⅞	...	...	...	...	829 9 11	...	7,957
...	150 0 0	6½	...	...	...	...	421 18 11	32 8 5	5,340
...	80 0 0	5⅛	...	...	...	...	254 4 0	...	4,001
...	1,550 0 0	11	6,600 0 0	...	...	**138 19 6	12,698 15 0	...	34,582
4 0 0	340 0 0	8½	...	3 16 0	...	...	653 0 9	34 19 1	11,433
...	90 0 0	7	...	...	...	...	272 16 11	...	2,673
5 0 0	211 13 2	1/0⅜	...	...	...	...	666 18 2	...	4,528
...	310 0 0	6¾	...	...	...	0 6 10	614 8 10	8 4 6	10,942
...	270 0 0	6 7/10	...	...	...	4 12 5	704 14 5	...	9,616
...	105 14 9	9 7/10	...	...	...	...	268 11 0	96 6 10	2,945
...	265 0 0	7½	...	...	...	...	506 13 5	213 3 7	8,961
...	201 9 2	4⅝	...	25 9 11	...	...	974 3 3	...	10,800
...	311 6 2	10	...	...	...	0 10 0	536 11 5	...	8,458
...	211 2 3	1/1	...	...	...	...	293 18 0	40 1 2	4,139
...	150 0 0	5⅛	...	...	...	...	252 12 0	...	6,058
...	100 0 0	6	...	...	...	...	242 4 9	9 6 7	4,607
...	117 18 7	5	...	...	...	0 14 2	259 3 1	...	5,488
165 0 0	1,300 0 0	1/	...	180 15 3	...	††38 11 10	3,708 17 11	79 14 5	27,322
...	...	...	...	...	38 5 3	4 0 6	104 6 6	...	...
...	...	...	...	...	66 16 1	8 9 8	234 12 6	...	...
3 0 0	550 0 0	‡‡	...	...	...	4 5 7	1,146 12 6	42 18 10	16,644

* Owners, 3d.; Occupiers, 6d., 3d., 1½d.
† Owners, 2 5/8d.; Occupiers, 2⅝d., 1 1/16d., ¾d.
‡ From Local Committee for Training King's Students, £277 7s. 6d.
§ Owners, 1 3/4d.; Occupiers, 2d., 1 1/8d., ⅛d.
‖ From Dundee Educational Trust, £100.
¶ Owners, 2½d.; Occupiers, 2⅝d., 2 1/16d., 1 1/16d., 2¼d.
** From Forfar Educational Trust, £50.
†† From Cortachy and Clova, under Boundary Award.
‡‡ Owners, 4½d.; Occupiers, 5d., 3⅝d., 1⅜d., 4 1/16d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(*a*) Annual Grants and Drawing Grants.	(*b*) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
FORFAR—*contd.*								
Lintrathen	39 18 1	...	70 4 0	168 12 3	66 6 6	...	...	...
Lochlee	...	...	27 12 0	62 15 0	60 7 0	...	...	...
Logie-Pert	...	...	96 0 0	358 18 6	215 6 6	...	3 19 6	...
Lunan	19 7 5	...	31 4 0	60 17 0	60 16 0	...	...	...
Lundie	...	...	28 4 0	66 4 9	50 11 6	...	...	...
Mains and Strathmartine	...	...	246 0 0	449 3 9	162 5 0	...	...	...
Maryton	40 2 3	...	30 12 0	68 19 0	60 16 0	...	...	...
Menmuir	...	...	33 4 0	93 3 3	18 13 6	...	...	...
Monifieth	31 19 9	1 7 6	301 16 0	610 5 11	113 3 6	7 3 6	30 14 7	...
Monikie	81 2 7	1 12 0	142 4 0	294 17 9	53 6 6	11 1 0	...	...
Montrose (B.)	...	198 4 6	1,077 12 0	2,109 3 8	434 2 0	371 18 10	817 7 0	...
Montrose (L.)	74 1 10	...	81 12 0	146 17 0	30 12 0	...	...	...
Murroes	...	...	91 4 0	168 2 6	64 4 0	...	...	...
Navar and Lethnot	28 13 1	...	12 12 0	50 4 6	7 17 6	...	...	...
Newtyle	...	...	62 8 0	113 6 0	63 8 0	...	...	...
Oathlaw	...	...	31 4 0	76 3 0	13 10 0	...	...	...
Panbride	...	...	150 0 0	315 0 0	56 5 0	...	...	...
Rescobie	...	...	16 16 0	40 5 9	6 6 0	...	...	...
Ruthven	...	...	27 12 0	65 8 6	50 7 0	...	...	...
St. Vigeans and Arbroath (L.)	57 12 9	...	108 12 0	223 15 3	122 19 6	...	...	...
Stracathro	...	...	47 8 0	86 15 3	15 15 0	...	...	...
Tannadice	...	17 0 1	87 0 0	358 13 3	172 17 0	...	...	...
Tealing	...	...	65 8 0	126 13 9	64 10 6	...	...	...
Total of Forfar	1,220 18 5	5,381 7 11	21,969 4 0	48,899 6 9	10,280 10 0	3,937 19 5	5,973 8 9	139 6 11
HADDINGTON.								
Aberlady	113 19 5	...	72 12 0	131 11 6	27 4 6	...	...	...
Athelstaneford	78 18 0	1 2 0	68 8 0	128 6 9	25 13 0	9 19 11	...	...
Bolton	0 2 9	...	20 8 0	51 17 6	57 13 0	18 10 11	...	9 0 0
Dirleton	...	...	161 8 0	304 5 6	150 10 6	..	...	9 0 0
Dunbar (B.)	...	17 11 4	316 16 0	829 5 7	118 16 0	...	...	...
Dunbar (L.)	...	1 2 0	162 0 0	300 7 0	61 4 0	45 11 1	...	17 19 6
Garvald	57 1 9	...	42 0 0	80 8 9	15 15 0	...	...	...
Gladsmuir	41 0 6	...	138 0 0	263 4 6	141 15 0	24 3 7	...	18 0 0
Haddington (including B.)	22 9 9	20 13 10	346 4 0	739 15 0	129 16 6	132 15 1	...	9 0 0
Humbie	119 8 7	...	30 12 0	141 18 6	11 9 6	...	...	9 0 0
Innerwick	...	...	55 4 0	213 18 6	22 1 0	...	...	...
Morham	24 17 2	...	30 12 0	72 15 3	51 9 6	...	...	...
North Berwick	...	46 18 0	234 0 0	553 16 3	149 0 0	16 13 9	...	...
Oldhamstocks	...	...	22 16 0	60 10 9	60 2 6	...	...	...
Ormiston	...	...	141 0 0	260 11 6	52 17 6	...	...	9 0 0
Pencaitland	69 15 6	...	73 4 0	280 13 6	25 8 6	...	...	...
Prestonkirk	...	...	107 8 0	202 16 6	40 5 6	10 1 0	...	...
Prestonpans	228 1 4	...	464 8 0	908 11 0	174 3 0	...	65 3 11	...
Salton	...	...	37 16 0	192 13 3	98 19 6	...	...	...
Spott	...	...	23 8 0	51 18 6	58 15 6	...	...	...
Stenton	23 18 10	...	57 12 0	231 1 6	21 12 0	...	...	...
Tranent	...	45 2 6	795 0 0	1,582 13 3	298 2 6	31 6 3	283 17 11	9 0 0
Whitekirk and Tynninghame	...	...	74 8 0	134 17 6	27 18 0	...	...	...
Whittingehame	44 17 8	...	15 12 0	37 1 0	5 17 0	...	...	...
Kingside (Comb.)	3 4 9	...	5 8 0	25 3 3	2 0 6	...	...	...
Yester	44 14 0	...	79 16 0	156 11 9	69 18 6	...	...	...
Total of Haddington	872 10 0	132 9 8	3,576 0 0	7,936 13 10	1,898 8 0	289 1 7	349 1 10	89 19 6

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	300 0 0	6d	300 0 0	...	...	...	945 0 10	...	11,391
...	121 14 8	6	...	...	...	...	272 8 8	64 3 3	4,947
...	375 0 0	1/2½	...	...	...	0 19 0	1,050 3 6	...	7,057
1 0 0	90 0 0	4½	...	2 2 4	...	...	265 6 9	...	4,261
...	100 0 0	7½	...	...	...	1 5 0	246 5 3	37 3 3	2,842
8 0 0	725 0 0	5⅝	...	...	...	24 10 2	1,614 18 11	23 1 10	23,783
...	75 0 0	5¾	...	...	...	...	275 9 3	...	2,950
...	200 0 0	10	...	...	...	...	345 0 9	...	5,991
...	850 0 0	11	...	...	...	9 3 2	1,955 13 11	...	19,768
...	500 0 0	8½	...	...	...	1 12 6	1,085 16 4	...	15,748
...	3,300 0 0	1/6.5/11	...	18 15 11	...	*657 15 5	8,984 19 4	...	42,553
...	150 0 0	3⅛	...	...	...	0 6 1	483 8 11	...	10,335
5 0 0	180 0 0	†	...	...	...	...	508 10 6	14 6 3	9,204
...	100 0 0	6½	...	...	...	3 12 3	202 19 4	...	3,817
...	400 0 0	9½	...	...	...	...	639 2 0	...	10,208
...	100 0 0	5¾	...	...	...	1 15 10	222 12 10	79 12 11	4,709
...	250 0 0	5	...	...	...	...	771 5 0	182 5 11	14,302
...	150 0 0	5½	...	5 0 0	...	...	218 7 9	...	7,263
...	90 0 0	1/	...	...	...	8 0 0	241 7 6	100 6 3	1,800
1 0 0	370 0 0	5¼	...	...	...	1 5 0	885 4 6	...	17,177
...	205 0 0	6½	...	...	...	...	354 18 3	...	4,875
4 0 0	260 0 0	4½	250 0 0	...	2 2 3	...	1,151 12 7	...	14,121
...	180 0 0	8	...	...	...	10 4 8	446 16 11	...	5,122
1,390 19 6	68,180 3 3	...	26,880 0 0	260 16 7	107 3 7	1,142 14 11	195,764 0 0	2,967 4 7	1,438,267
...	125 0 0	3	...	28 8 8	...	0 19 6	499 15 7	...	10,394
...	220 0 0	5½	...	...	...	...	532 7 8	...	9,596
...	80 0 0	8	...	...	...	...	237 12 2	...	2,777
...	700 0 0	6½	...	...	...	0 8 8	1,325 12 8	...	25,081
40 0 0	700 0 0	‡	...	80 0 0	...	2 10 1	2,104 19 0	1,126 1 2	18,649
...	500 0 0	§	300 0 0	...	...	...	1,388 3 7	...	18,160
...	170 0 0	5¼	...	...	...	...	365 5 6	...	7,702
...	500 0 0	‖	...	...	...	...	1,126 3 7	...	12,654
...	1,220 0 0	¶	...	...	...	77 12 10	2,698 7 0	...	33,182
...	220 0 0	7⅞	...	...	...	...	532 8 7	...	6,537
...	160 0 10	4½	...	...	...	...	451 4 4	...	8,872
...	87 4 9	7¾	150 0 0	...	...	3 2 1	420 0 9	...	2,257
...	1,430 0 0	**	...	...	...	10 9 10	2,440 17 10	...	35,378
...	170 13 2	10¾	...	...	...	...	314 2 5	28 17 2	4,305
...	350 0 0	11⅞	...	...	61 7 0	3 10 0	878 6 0	...	7,648
...	245 0 0	5.9/10	...	...	...	15 0 0	709 1 6	...	9,570
...	580 0 0	10½	...	...	...	1 8 0	941 19 0	12 5 6	13,962
...	550 0 0	6	...	70 0 0	...	10 15 0	2,471 2 3	...	22,286
...	136 1 5	5¾	...	8 8 0	...	...	473 18 2	...	4,641
...	158 13 1	6¾	...	1 16 0	...	...	294 11 1	9 7 5	5,252
...	225 0 0	7¼	...	...	...	3 3 6	562 7 10	...	5,267
...	1,000 0 0	††	3,170 0 0	200 0 0	...	8 11 8	7,423 14 1	...	28,422
...	400 12 9	1/0.5/8	...	1 7 6	...	...	639 3 9	...	8,663
...	160 0 0	6	...	...	...	...	263 7 8	...	6,423
...	...	...	...	...	32 0 0	...	67 16 6	...	...
..	125 0 0	3½	...	...	31 4 5	...	507 4 8	...	6,069
40 0 0	10,213 6 0	...	3,620 0 0	390 0 2	124 11 5	137 11 2	29,669 13 2	1,176 11 3	313,747

* Price of Property sold, £6222 9s. 2d.
† Owners, 2.1/10d.; Occupiers, ⅜d., 1½d., 1½d., 2⅝d.
‡ Owners, 4½d.; Occupiers, 1.7/8, 4½d. §Owners, 3½d.; Occupiers, 1½d., 4d. ‖ Owners, 4½d.; Occupiers, 2½d., 3½d., ½d.
¶ Burgh—Owners, 7½d.; Occupiers, 3½d., 7½d. Parish—Owners 2½d.; Occupiers, 1½d., 3d.
** Owners, 5d.; Occupiers, 5d., 2½d., 1⅜d. †† Owners, 4½d.; Occupiers, 6d., 2½d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
INVERNESS.								
Mainland.								
Abernethy and Kincardine	98 4 9	...	102 12 0	265 2 11	38 9 6	...	...	...
Alvie	95 9 8	...	47 8 0	153 5 6	57 15 6	...	...	...
Ardersier	...	...	93 0 0	215 13 9	54 17 6	...	...	...
Arisaig and Moidart	...	2 3 0	51 12 0	134 5 0	58 0 0	...	...	...
Boleskine and Abertarff	16 12 2	12 19 11	115 16 0	263 11 3	123 8 6	...	...	...
Croy and Dalcross	58 12 0	...	100 16 0	186 4 0	37 16 0	...	...	...
Daviot and Dunlichty	1 0 8	...	70 16 0	237 6 6	196 11 0	...	...	...
Dores	...	...	75 0 0	242 14 0	108 2 6	...	...	...
Duthill and Rothiemurchus	...	...	178 4 0	448 15 3	106 16 6	...	...	1 0 0
Glenelg	41 1 9	0 11 0	119 7 0	303 16 3	56 6 3	4 17 4	...	...
Glengarry	...	...	48 0 0	135 16 9	18 0 0	...	...	...
Insh	0 13 8	...	12 12 0	50 12 9	45 12 6	...	...	...
Inverness (B.)	...	14 15 0	1,339 0 0	4,105 2 7	689 12 6	291 11 7	...	75 0 0
Inverness (L.) and Bona	...	...	276 12 0	687 15 1	363 14 6	...	...	...
Kilmallie	...	3 14 0	271 16 0	855 16 4	141 18 6	...	...	...
Kilmonivaig	95 18 10	4 18 7	90 12 0	220 19 1	73 19 6	...	...	...
Kilmorack	...	1 0 0	155 8 0	415 1 9	58 5 6	...	...	...
Kiltarlity	...	...	192 0 0	513 3 8	72 18 0	19 5 11	...	...
Kingussie	...	...	217 16 0	776 17 8	161 13 6	...	...	...
Kirkhill	130 11 3	...	128 8 0	315 3 3	168 3 0	...	...	6 0 0
Laggan	19 9 9	...	60 0 0	205 9 6	72 10 0	...	...	...
Moy and Dalarossie	...	...	62 8 0	285 0 9	125 4 0	...	...	...
Petty	...	...	97 16 0	227 0 9	66 13 6	...	...	...
Urquhart and Glenmoriston	...	60 17 9	149 8 0	550 12 9	126 0 6	...	...	...
Insular.								
Barra	...	0 10 10	307 4 0	699 16 10	125 4 0	...	441 16 11	...
Bracadale	...	...	57 12 0	154 7 9	21 12 0	...	...	...
Duirinish	132 9 10	...	262 16 0	683 12 9	238 11 0	...	238 18 11	...
Harris	447 13 9	...	465 12 0	1,123 0 4	244 12 0	...	458 0 10	...
Kilmuir	...	...	75 12 0	175 15 6	78 7 0	...	79 5 0	...
North Uist	...	0 2 10	369 0 0	963 14 8	448 7 6	...	715 4 3	...
Portree	188 4 3	2 17 3	250 16 0	829 3 5	184 1 0	8 13 6	200 2 8	...
Sleat	51 12 4	...	145 16 0	421 18 6	224 13 6	...	208 7 7	...
Small Isles	116 3 6	...	31 16 0	96 15 9	11 18 6	...	...	...
Snizort	29 7 1	0 14 0	192 12 0	488 14 3	142 4 6	...	288 5 2	...
South Uist	...	2 1 1	459 12 0	1,073 3 10	252 7 0	...	522 3 11	...
Stenscholl	25 19 5	...	129 0 0	352 8 3	118 7 6	...	65 13 1	...
Strath	103 11 5	...	207 0 0	580 14 9	197 12 6	...	177 19 2	1 0 0
Total of Inverness	1,652 16 1	107 5 3	7,510 15 0	19,438 13 8	5,310 6 9	324 8 4	3,395 17 6	83 0 0
KINCARDINE.								
Arbuthnott	61 2 11	...	53 8 0	124 10 0	60 0 6	23 19 6	...	...
Banchory-Devenick	...	...	155 8 0	318 19 3	128 5 6	...	...	...
Banchory-Ternan	75 18 11	40 8 6	170 0 0	199 7 6	185 12 6	...	...	...
Benholm	38 18 10	...	147 0 0	284 0 6	95 2 6	...	33 11 0	...
Bervie (including B.)	88 6 6	...	231 12 0	429 7 9	116 17 0	12 8 10	85 4 9	...
Dunnottar	...	...	205 4 0	474 9 3	130 2 0	22 11 6	93 18 1	...
Durris	...	...	82 4 0	172 8 3	80 16 6	...	...	...
Fettercairn	...	...	93 0 0	195 13 0	84 17 6	35 19 11	...	...
Fetteresso and Rickarton	173 1 0	5 6 7	449 8 0	922 11 11	292 7 0	35 5 2	...	...
Fordoun	...	...	173 8 0	373 4 0	65 0 6	31 12 8	...	...
Garvock	24 17 10	0 6 0	18 12 0	53 12 9	6 19 6	9 13 3	...	...
Glenbervie	...	...	88 16 0	191 9 9	73 6 0	9 12 1	...	...
Kinneff and Catterline	21 5 1	...	64 16 0	141 18 4	75 4 0	...	...	...

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	140 0 0	3	...	...	...	5 2 6	649 11 8	112 15 10	8,880
...	149 4 0	6	...	...	...	...	503 2 8	...	5,866
...	220 0 0	1/2½	...	...	...	...	583 11 3	141 15 11	2,709
...	355 0 0	1/1	...	...	...	6 13 0	607 13 0	...	6,009
...	400 0 0	8¾	2,187 0 0	...	...	...	3,119 7 10	48 4 2	11,689
...	420 0 0	1/5½	...	...	...	...	803 8 0	...	5,669
...	300 0 0	9½	...	...	...	...	805 14 2	12 17 10	7,444
...	346 14 7	1/1½	...	...	...	...	772 11 1	106 8 11	6,147
...	350 0 0	5¼	...	21 15 9	...	6 15 0	1,113 6 6	132 9 6	13,844
...	556 9 3	1/6	...	...	...	4 10 0	1,086 18 10	16 3 7	7,493
...	145 7 11	7	...	...	..	0 2 0	347 6 8	59 15 9	5,143
...	134 11 8	4	...	...	...	17 0 0	261 2 7	...	7,652
...	6,636 0 0	1/7¾	325 0 0	...	...	54 2 9	14,530 4 5	...	97,201
...	1,100 0 0	11	218 0 0	...	...	...	2,646 1 7	193 19 8	27,310
50 0 0	1,300 0 0	11¾	...	...	...	114 19 10	2,738 4 8	540 10 4	26,347
...	460 0 0	4¾	...	...	...	20 0 0	966 8 0	...	22,250
9 0 0	600 0 0	11¼	...	...	...	5 17 0	1,244 12 3	106 19 11	13,597
1 0 0	300 0 0	*	...	...	23 9 11	...	1,121 17 6	41 9 9	9,946
50 0 0	556 1 6	8	...	...	...	60 0 0	1,822 8 8	1,791 19 3	17,373
...	100 0 0	3	..	...	...	...	848 5 6	...	7,544
...	340 0 0	6	...	...	...	0 15 10	698 5 1	...	12,985
...	200 0 0	3½	...	...	...	...	672 12 9	...	12,316
1 0 0	300 0 0	1/3½	...	...	...	...	692 10 3	...	6,170
50 0 0	606 0 0	10¾	...	...	46 0 7	...	1,582 19 7	68 2 10	13,689
1 0 0	226 6 0	3/9	...	...	...	17 1 0	1,818 19 7	...	1,694
...	355 0 0	2/1¼	...	...	...	0 6 6	588 18 3	...	3,753
...	650 0 0	2/11	300 0 0	...	...	†214 10 0	2,720 18 6	...	5,268
2 0 0	572 0 0	2/1	...	...	...	‡589 13 0	3,902 11 11	...	4,303
...	150 0 0	2/2½	...	...	...	1 2 6	560 2 0	40 16 4	1,765
2 0 0	500 0 0	2/5	...	...	...	19 15 9	3,018 5 0	...	4,451
50 0 0	673 7 4	1/10½	...	...	...	67 13 5	2,454 18 10	...	8,135
1 0 0	279 3 5	2/1½	...	...	...	§61 19 5	1,394 10 9	...	2,945
...	174 4 4	9	...	...	...	...	430 18 1	...	2,961
3 0 0	239 12 11	1/8	...	...	...	14 6 6	1,398 16 5	...	3,386
...	600 0 0	1/6	...	...	...	24 1 8	2,933 9 6	119 14 10	4,180
4 0 0	90 9 2	1/2	...	...	...	30 0 0	815 17 5	47 10 6	1,726
3 0 0	341 0 0	1/8	...	...	...	‖69 12 11	1,681 10 9	...	4,441
227 0 0	20,860 12 1	...	3,530 0 0	21 15 9	69 10 6	1,406 0 7	63,938 1 6	3,581 14 11	404,281
2 5 0	110 0 0	3½	...	...	...	...	435 5 11	..	6,185
...	550 0 0	1/0⅝	...	19 2 8	...	¶96 2 7	1,267 18 0	81 15 6	10,814
3 15 0	875 14 0	8⅝	300 0 0	...	...	5 3 4	1,855 19 9	385 19 1	24,135
2 5 0	220 0 0	8¾	...	...	...	1 8 8	822 6 6	...	6,276
1 10 0	242 4 11	8	...	...	...	...	1,207 11 9	...	6,995
3 0 0	580 0 0	1/2	...	...	...	...	1,509 4 10	296 11 7	10,391
...	273 1 2	8	...	...	...	...	608 9 11	...	8,047
...	430 0 0	**	...	1 17 0	...	...	841 7 5	51 18 3	9,640
7 10 0	1,162 14 10	8	...	...	17 2 5	5 7 0	3,070 13 11	...	34,961
...	620 11 7	10⅜	...	...	...	0 6 6	1,264 3 3	461 0 6	15,561
...	73 5 10	3¾	...	...	...	...	187 7	...	3,922
...	252 7 6	10	...	...	...	7 2 10	622 14 2	...	6,335
...	230 19 2	8¾	...	...	...	...	534 2 7	7 19 2	6,034

* Owners, 3½d. ; Occupiers, 4½d., 1½d.

† Grant from Department under Minutes of 4th March 1895, and 19th March 1906, £200.

‡ ,, ,, ,, ,, ,, £530.

§ ,, ,, ,, ,, ,, £60.

‖ ,, ,, ,, ,, ,, £60.

From Peterculter under Boundary Award.

** Owners, 5½d. ; Occupiers, 2⅜d., 4¾d., 9½d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
KINCARDINE—*contd.*								
Laurencekirk	26 11 0	...	221 8 0	472 10 2	83 0 6	45 11 8	...	...
Maryculter	21 13 11	...	78 12 0	10 0 0	29 14 0	...	...	...
Marykirk	33 13 6	...	65 4 0	...	36 4 6	...	...	...
Nigg	163 17 5	6 0 0	151 4 0	295 0 0	96 14 0	...	...	...
St. Cyrus	18 19 7	...	111 12 0	289 14 3	41 17 0	...	...	...
Strachan	...	...	52 16 0	120 3 6	60 18 6	...	...	...
Total of Kincardine	748 6 6	52 1 1	2,613 12 0	5,069 0 2	1,742 19 6	226 14 7	212 13 10	...
KINROSS.								
Blairingone	30 17 1	...	49 4 0	98 11 11	58 9 0	...	...	...
Cleish	...	...	22 16 0	153 15 9	112 16 6	...	...	...
Fossoway and Tullibole	...	...	82 16 0	346 7 6	191 1 0	...	...	...
Kinross	229 11 7	...	253 16 0	509 9 10	95 3 6	...	...	...
Orwell	...	...	80 8 0	152 11 7	30 3 0	...	...	...
Portmoak	57 3 7	...	60 0 0	112 18 4	64 1 6	...	...	...
Total of Kinross	317 12 3	...	549 0 0	1,373 14 11	551 14 6	...	...	...
KIRKCUDBRIGHT.								
Anwoth	...	1 10 0	58 16 0	...	25 13 0	...	...	..
Balmaclellan	32 4 2	...	40 4 0	118 3 6	55 1 6	...	...	...
Balmaghie	36 2 0	...	64 4 0	66 10 6	64 1 6	...	...	...
Bargrennan	...	...	28 16 0	136 16 6	10 16 0	...	...	...
Borgue	...	...	101 8 0	202 17 9	38 0 6	...	...	...
Buittle	53 10 4	...	52 16 0	125 3 3	99 16 0	...	...	...
Carsphairn	...	...	34 16 0	78 6 9	63 1 0	...	...	...
Colvend	...	...	103 4 0	211 9 0	118 14 0	...	...	...
Corsock	21 15 11	...	33 0 0	70 19 6	62 7 6	...	...	...
Crossmichael	...	...	90 12 0	220 8 4	112 3 6	...	...	...
Dalry	74 14 11	...	72 12 0	182 12 9	67 4 6	...	...	...
Girthon	...	...	49 16 0	104 10 6	60 9 6	...	...	...
Irongray	80 17 8	2 9 1	51 12 0	120 3 9	59 7 0	21 2 1	...	...
Kells	...	...	77 8 0	179 7 9	69 0 6	...	...	...
Mossdale (Comb.)	...	...	13 16 0	39 4 0	5 3 6	...	...	...
Kelton	...	9 12 6	410 4 0	1,012 5 0	243 18 0	31 12 3	77 1 1	130 0 0
Kirkbean	...	...	75 0 0	148 4 6	28 2 6	...	...	...
Kirkcudbright (including B.)	...	3 7 4	213 12 0	457 5 8	174 12 0	24 10 11	...	...
Kirkgunzeon	58 9 0	...	24 16 0	...	...	...	...	...
Kirkmabreck	...	...	185 8 0	334 13 3	69 10 6	...	...	...
Kirkpatrick-Durham	...	1 11 0	54 12 0	101 4 0	19 7 0	...	...	...
Lochrutton	23 15 6	1 6 2	36 0 0	75 5 0	53 10 0	...	...	...
Minnigaff	...	...	110 8 0	126 3 6	41 8 0	...	...	...
New Abbey	...	...	100 16 0	193 14 6	37 16 0	8 6 8	...	...
Parton	...	...	25 16 0	62 10 0	49 13 6	..	...	...
Rerrick	...	...	129 12 0	266 19 9	88 12 0	...	...	...
Terregles	15 0 7	...	26 8 0	48 4 6	9 18 0	...	...	...
Tongland	9 19 11	...	52 4 0	95 8 0	60 5 0	...	...	...
Troqueer	65 17 0	6 13 1	588 0 0	1,140 0 0	220 10 0	54 15 2	...	...
Twynholm	3 12 6	...	63 0 0	112 14 3	23 12 6	...	...	...
Urr	...	17 2 10	511 16 0	1,243 11 1	321 18 6	91 6 5	183 15 8	70 0 0
Total of Kirkcudbright	475 19 6	43 12 0	3,480 12 0	7,275 1 10	2,353 13 0	231 13 6	260 16 9	200 0 0

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
2 5 0	347 14 9	8½	...	...	133 0 1	17 18 9	1,349 19 11	6 5 3	10,122
...	262 0 0	9 1/16	...	...	...	...	401 19 11	177 18 10	7,390
3 0 0	260 0 0	*	...	...	...	...	398 2 0	267 15 10	9,711
0 15 0	350 0 0	7⅜	...	...	...	1 15 0	1,065 5 5	...	11,568
2 5 0	325 0 0	†	...	...	...	5 11 3	794 19 1	25 19 5	14,485
...	281 2 9	1/1½	...	...	...	1 10 3	516 11 0	2 14 8	5,293
28 10 0	7,446 16 6	...	300 0 0	20 19 8	150 2 6	142 6 2	18,754 2 6	1,765 18 1	97,865
...	186 10 9	11	...	...	...	0 15 0	424 7 9	...	4,069
...	135 0 0	4½	...	...	...	...	424 8 3	...	7,395
...	250 0 0	6	...	...	25 0 10	17 18 3	913 3 7	...	10,263
...	700 0 0	‡	5,200 0 0	...	...	20 3 5	7,008 4 4	...	17,350
...	280 0 0	§	...	...	...	...	543 2 7	...	17,027
...	110 0 0	2½	...	...	...	...	404 3 5	...	8,137
...	1,661 10 9	...	5,200 0 0	...	25 0 10	38 16 8	9,717 9 11	..	64,241
...	170 0 0	7½	...	23 13 4	96 16 11	...	376 9 3	260 11 0	5,106
...	200 0 0	6⅝	...	40 0 0	...	...	485 13 2	...	7,282
...	310 0 0	7¼	...	...	...	...	540 18 0	64 11 9	9,803
...	150 5 6	6¼	...	5 7 1	...	...	332 1 1	64 16 0	5,514
...	330 0 0	8⅜	...	78 5 0	...	1 0 0	751 11 3	...	10,554
...	200 0 0	4⅜	...	7 14 11	...	...	539 0 6	...	10,186
...	236 0 0	8⅛	...	12 10 0	3 13 7	...	428 7 4	...	8,262
...	420 0 0	10½	...	...	...	0 10 0	853 17 0	34 19 9	9,428
...	124 13 8	6¼	...	...	...	...	312 16 7	...	5,211
...	370 0 0	7¼	...	...	...	...	793 3 10	...	12,630
...	300 0 0	7⅜	...	30 0 0	9 14 3	0 10 0	737 8 5	...	9,560
...	360 0 0	1/0½	...	...	...	...	564 16 0	...	7,907
...	220 0 0	5⅞	...	0 6 0	...	0 15 0	556 12 7	...	8,979
...	422 0 11	1/1	...	12 10 0	6 13 6	5 10 2	772 10 10	46 3 2	9,310
...	...	...	...	...	63 0 0	8 0 0	129 3 6	40 5 10	...
90 0 0	1,000 0 0	11¼	...	...	...	0 15 0	3,005 7 10	...	22,814
...	247 7 6	10	...	27 2 9	...	2 0 0	527 17 3	139 10 2	6,021
...	740 0 0	‖	...	...	...	100 0 0	1,713 7 11	...	19,561
...	180 0 0	6	...	...	...	0 18 10	264 3 10	...	6,404
...	320 0 0	7	625 0 0	75 0 0	...	2 10 0	1,612 6 9	547 8 10	11,110
...	236 9 3	9	...	...	...	0 6 6	413 9 9	...	6,893
...	105 0 0	4	...	...	...	...	294 16 8	...	6,665
...	375 0 0	11	1,350 0 0	1 18 0	...	2 17 5	2,007 14 11	675 7 7	9,072
...	290 0 0	11⅝	...	8 3 2	...	14 13 4	653 9 8	37 5 4	5,928
...	160 0 0	8	...	...	...	...	297 19 6	34 2 9	4,934
...	380 0 0	6¾	...	...	...	...	865 3 9	...	14,395
...	110 0 0	5	...	...	...	1 0 0	210 11 1	...	4,991
...	150 0 0	4 1/16	...	...	...	...	367 16 11	...	8,056
...	1,500 0 0	1/-	...	...	...	...	3,575 15 3	...	31,860
...	235 0 0	5½	...	...	...	...	437 19 3	...	7,202
90 0 0	1,020 0 0	1/	375 0 0	...	11 4 3	8 11 2	3,944 5 11	...	21,671
180 0 0	10,851 16 10	...	2,350 0 0	322 10 3	191 2 6	149 17 5	28,366 15 7	1,945 2 2	307,309

* Owners, 3½d. ; Occupiers, 2 7/10d., 2d., 3½d.
† Owners, 2⅝d. ; Occupiers, 5⅝d., 3⅜d., 2¾d., 1½d.
‡ Owners, 4½d. ; Occupiers, 7 3/10d., 3⅜d., 1⅝d.
§ Owners. 1½d. ; Occupiers, 2½d., 1¼d., ½d.
‖ Owners, 4½d. ; Occupiers, 6d., 3¾d., 1¼d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(*a*) Annual Grants and Drawing Grants.	(*b*) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
LANARK.								
Airdrie (B.)	...	25 0 8	1,974 12 0	6,886 16 3	1,083 16 6	679 3 11	962 9 6	...
Avondale	259 10 5	80 19 11	422 8 0	1,097 2 10	198 8 0	104 17 2	...	34 19 1
Biggar	...	1 17 6	199 16 0	561 19 11	74 18 6	17 6 3	52 4 3	26 2 0
Blantyre	198 4 10	169 18 9	1,120 16 0	2,181 14 8	460 6 0	88 16 2	322 13 5	13 12 11
Bothwell	...	36 4 0	3,923 8 0	8,418 6 6	1,509 5 0	743 14 4	554 10 3	131 2 1
Cadder	...	13 3 11	1,059 12 0	1,937 4 3	457 7 0	91 10 11	212 4 6	...
Calderhead	62 3 0	7 17 0	669 12 0	1,316 15 6	251 2 0	68 10 6	223 10 5	2 11 4
Allanton (Comb.)	5 12 7	...	61 16 0	108 17 3	23 3 6	...	...	...
Cambuslang	...	323 5 2	1,675 16 0	3,483 18 11	628 8 6	461 9 4	...	117 3 1
Cambusnethan	1,727 10 10	97 4 0	2,385 4 0	4,825 9 2	894 9 0	1,026 17 8	195 3 9	233 2 4
Carluke	...	185 9 0	945 12 0	2,149 6 0	434 12 0	226 9 5	260 16 8	46 12 10
Carmichael	...	...	27 12 0	66 19 9	60 7 0	...	...	...
Carmunnock	...	11 1 1	54 12 0	111 12 3	20 9 6	...	...	...
Carnwath	1,019 6 8	62 16 0	546 0 0	902 3 9	274 10 6	...	...	...
Carstairs	36 8 4	...	197 9 0	384 16 3	74 0 10	18 0 11	...	6 0 4
Clarkston	...	117 9 11	1,238 4 0	1,419 10 7	277 8 6	160 12 7	317 1 10	...
Covington and Thankerton	11 6 3	...	28 16 0	64 17 0	10 16 0	...	...	...
Crawford	...	...	60 12 0	159 17 3	112 14 6	...	...	...
Crawfordjohn	126 18 8	...	61 16 0	155 10 6	73 3 6	27 1 6	...	9 0 6
Culter	...	...	43 4 0	81 10 0	66 4 0	...	...	...
Dalserf	199 4 3	10 4 8	517 4 0	997 6 11	193 19 0	67 19 0	167 6 9	22 1 0
Dalziel	1,589 16 3	494 19 10	3,507 0 0	7,657 14 1	1,315 2 6	989 14 9	988 1 8	...
Dolphinton	185 17 6	...	34 16 0	83 13 9	63 1 0	...	...	..
Douglas	146 16 4	3 14 8	215 8 0	460 3 6	80 15 6	43 12 9	...	6 7 3
Douglas Water	...	0 11 6	173 8 0	343 17 0	65 0 6	41 7 11	95 18 8	7 16 4
Dunsyre	36 10 5	1 15 0	21 12 0	61 10 9	48 2 0	...	...	...
East Kilbride	...	61 14 3	254 8 0	526 19 4	175 8 0	18 5 6	...	6 1 10
Glasgow (B.)	26,429 1 8	7,762 18 10	41,594 12 0	87,397 18 9	15,606 10 6	11,109 0 9	...	...
Glassford	72 19 8	6 7 6	114 0 0	218 17 0	42 15 0	13 7 8	...	...
Govan	10,362 1 8	8,467 0 6	16,447 18 0	35,689 3 4	6,185 5 9	4,539 6 9	...	...
Hamilton (B.)	...	452 5 6	1,776 12 0	3,896 11 7	696 4 6	1,859 9 6	1,956 2 9	35 3 11
Hamilton (L.)	...	15 0 7	1,807 4 0	3,788 10 2	727 14 0	626 18 5	...	16 18 10
Lanark (B.)	55 2 1	180 13 0	527 8 0	1,413 18 3	227 15 6	83 9 8	288 7 4	86 5 2
Lanark (L.)	12 0 5	...	116 8 0	210 1 6	83 13 0	11 18 11	...	3 19 8
Larkhall	...	14 16 8	1,332 12 0	2,907 12 4	499 14 6	620 3 0	987 3	142 13 0
Leadhills	38 12 10	...	95 8 0	187 14 0	65 15 6	...	100 18 6	...
Lesmahagow	1,061 16 10	...	696 16 0	2,014 2 5	412 17 0	38 19 10	...	9 17 3
Libberton	...	...	30 12 0	81 4 0	11 9 6	...	...	...
Maryhill	2,162 18 2	148 0 1	3,238 9 0	6,030 15 8	1,214 13 7	213 10 0	537 10 6	...
New Monkland	76 0 11	...	703 4 0	1,380 14 0	263 14 0	...	195 2 5	...
Old Monkland	...	1,273 13 0	4,072 16 0	8,664 4 6	1,537 8 6	1,841 9 5	...	189 16 8
Pettinain	...	...	15 0 0	38 7 6	5 12 6	...	...	...
Rutherglen (including B.)	...	115 6 7	1,942 4 0	4,008 15 11	726 10 6	186 19 4	397 16 4	...
Shettleston	...	72 1 9	2,010 0 0	4,155 6 11	793 15 0	375 14 8	1,446 17 3	10 16 8
Millerston (Comb.)	...	2 14 6	83 8 0	155 10 3	61 5 6	...	...	...
Shotts	...	126 15 6	860 8 0	1,745 7 7	402 17 6	195 13 0	...	29 16 11
Springburn	...	...	1,035 12 0	2,206 11 8	388 7 0	...	661 14 9	...
Stonehouse	...	45 15 10	317 8 0	613 16 6	119 0 6	...	47 4 2	...
Sandford (Comb.)	...	...	20 8 0	41 1 6	7 13 0	...	...	...
Symington	...	...	31 16 0	72 18 9	51 18 6	...	...	...
Walston	...	...	45 12 0	206 19 9	57 2 0	...	...	...
Wandell and Lamington	...	...	18 0 0	51 1 0	6 15 0	...	...	...
Wiston and Roberton	45 3 10	...	29 8 0	92 3 9	11 0 6	...	...	...
Total of Lanark	45,921 4 5	20,388 16 8	100,383 16 0	213,715 1 9	39,134 7 2	26,591 11 6	10,970 19 0	1,188 1 0

School Boards for the Year ended the 15th May 1906 —INCOME—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
348 7 8	3,600 0 0	1/2	8,500 0 0	...	...	39 10 4	24,099 16 8	...	61,937
149 5 0	1,900 0 0	10	...	...	...	1 8 3	4,248 18 8	168 19 3	48,329
97 10 0	700 0 0	1/3	...	76 5 0	...	5 8 3	1,813 7 8	228 4 0	12,379
12 0 0	2,750 0 0	1/0½	...	..	14 10 3	21 19 9	7,354 12 9	...	56,710
449 12 6	11,000 0 0	1/0¼	8,361 0 0	...	...	*94 18 7	35,222 1 3	225 5 5	221,144
40 10 0	4,300 0 0	1/3	1,850 0 0	...	...	29 13 1	9,991 5 8	...	69,770
6 0 0	1,424 7 6	1/	300 0 0	...	...	29 0 9	4,361 10 0	...	28,698
...	...	...	...	...	210 11 8	...	410 1 0	...	...
97 10 0	9,600 0 0	†	600 0 0	...	...	66 15 6	17,054 6 6	...	104,144
254 5 0	6,679 9 5	1/4½	...	..	...	64 1 11	18,382 17 1	...	98,270
176 10 0	1,980 0 0	11¼	...	...	...	3 16 8	6,409 4 7	603 1 3	44,552
...	170 0 0	7¾	...	...	...	...	324 18 9	...	6,641
6 0 0	585 9 1	‡	...	...	...	0 10 0	789 13 11	171 17 6	12,857
14 0 0	1,700 0 0	1/2	758 0 0	...	...	30 4 3	5,307 1 2	...	30,331
4 10 0	520 0 0	10⅝	...	..	...	14 2 0	1,255 7 8	137 13 9	13,881
16 10 0	1,530 13 7	1/	...	...	79 0 10	58 12 11	5,215 4 9	2,503 7 10	31,845
1 10 0	145 0 0	7	...	7 10 0	...	...	269 15 3	12 11 6	5,427
...	290 10 1	3⅜	...	...	...	...	623 13 10	32 3 7	17,382
...	401 15 6	1/0⅝	...	...	...	...	855 6 2	...	8,991
6 0 0	200 0 0	7½	...	...	...	...	396 18 0	...	6,670
6 0 0	954 17 2	10¾	1,400 0 0	...	...	5 4 5	4,541 7 2	...	21,502
331 17 6	9,000 0 0	1/0¾	7,000 0 0	...	...	61 13 1	32,935 19 8	...	172,403
...	79 5 1	8½	...	49 19 0	11 8 4	...	508 0 8	...	2,666
4 10 0	464 7 2	6¾	...	...	...	4 8 8	1,430 3 10	...	16,547
..*	326 5 0	1/2	...	...	...	1 19 7	1,056 4 6	...	5,904
1 10 0	240 0 0	1/5½	...	...	...	...	411 0 2	36 7 1	3,761
12 0 0	1,000 0 0	‖	...	...	...	2 8 2	2,057 5 1	239 1 6	30,447
2,290 0 0	224 484 19 2	1/4	67,200 0 0	86 16 6	...	§4,689 18 8	488,651 16 10	...	3,543,565
7 10 0	450 0 0	10	...	...	...	...	925 16 10	...	11,333
2,450 0 0	69,000 0 0	1/2½	49,520 0 0	...	...	¶665 4 4	203,326 0 4	...	1,212,220
...	8,000 0 0	2/1	...	...	...	130 13 0	18,803 2 9	...	81,159
102 7 6	8,100 0 0	1/1¼	1,305 0 0	...	...	13 6 4	16,502 19 10	...	152,789
206 5 0	950 0 0	1/2	...	40 0 0	...	31 13 5	4,090 17 5	...	17,273
...	400 0 0	6	...	...	...	...	838 1 6	...	18,950
165 0 0	2,857 14 11	1/7¾	...	...	...	9 0 3	9,536 10 0	496 11 10	35,959
..	264 6 6	1/6	...	...	...	...	752 15 4	...	3,713
106 17 6	2,750 0 0	10	200 0 0	...	...	18 4 5	7,309 11 3	84 5 8	68,992
...	170 0 0	8¼	...	...	...	2 0 0	295 5 6	36 7 9	5,963
438 15 0	13,437 0 0	1/3	2,000 0 0	...	...	101 11 8	29,523 3 8	611 0 7	228,780
9 0 0	1,500 0 0	1/	...	...	...	8 12 10	4,136 8 2	...	32,605
280 2 6	13,000 0 0	1/1½	7,750 0 0	...	...	**210 17 8	38,820 8 3	1,241 2 8	238,368
...	130 0 0	8	...	...	...	...	189 0 0	...	4,089
...	7,400 0 0	1/3	5,000 0 0	40 0 0	...	††88 14 7	19,906 7 3	1,676 0 0	119,607
63 15 0	7,300 0 0	1/8½	...	0 14 9	...	44 14 5	16,273 16 5	4,116 8 6	92,601
...	...	...	...	...	592 1 9	1 17 6	896 17 6	510 12 2	...
10 10 0	2,800 0 0	1/1	...	...	37 19 3	15 12 7	6,225 0 4	355 11 11	56,974
153 7 6	2,000 0 0	1/3¼	...	...	...	...	6,445 12 11	2,394 6 0	32,736
15 0 0	553 12 7	9	...	...	...	3 3 0	1,715 0 7	18 5 10	15,554
...	...	...	...	...	96 10 1	...	165 12 7	...	...
...	150 0 0	8	...	...	...	...	306 13 3	2 1 0	5,051
...	185 0 0	1/8½	150 0 0	..	...	...	644 13 0	21 10 6	2,812
...	148 0 0	3⅛	...	...	...	0 10 0	224 6 0	28 11 1	10,369
...	200 0 0	7½	...	...	...	0 10 9	378 6 10	...	7,042
8,334 7 6	427,772 12 9	...	161,894 0 0	301 5 3	1,042 2 2	6,572 1 7	1,064,210 6 9	15,951 8 2	7,131,692

* Rents, £60 6s. 4d. † Owners, 11⅜d.; Occupiers, 1/0¼d., 10$\frac{7}{12}$d. ‡ Carmunnock District—Owners, 5¼d.; Occupiers, 5d.; East Kilbride District—Owners, 5¼d.; Occupiers, 7d., 2¼d. § Rents, £376 17s. 5d.; Grant from Home Office for Truant School, £720 10s 4d. ‖ Owners, 4d.; Occupiers, 5½d., 1¼d. ¶ Grant from Department under Minute of 30th May, 1903, £99 15s. 6d. ** Rents, £181 5s. 6d. †† Rents, £44 15s. 2d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(*a*) Annual Grants and Drawing Grants.	(*b*) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
LINLITHGOW.								
Abercorn	...	9 17 5	73 16 0	135 8 6	27 13 6	...	...	...
Bathgate (B.)	246 2 11	...	* ...	...	...	...	...	...
Bathgate (Comb.)	...	...	301 4 0	699 5 1	112 19 0	96 17 9	...	...
Bathgate (L.)	1,159 9 10	6 16 0	666 0 0	1,313 11 2	249 15 0	57 13 4	...	...
Borrowstounness and Carriden	224 2 7	10 9 0	918 0 0	1,897 0 11	515 14 0	...	680 12 2	...
Dalmeny (including B. of Queensferry)	101 1 1	...	323 8 0	612 17 3	121 5 6	20 4 1	...	...
Ecclesmachan	...	0 13 4	66 0 0	121 15 0	24 15 0	...	...	...
Craigbinning (Comb.)	20 0 7	...	21 0 0	35 3 6	7 17 6	...	...	...
Kirkliston	68 16 8	11 13 9	490 16 0	952 1 8	224 1 0	19 1 2	...	...
Linlithgow (including B.)	...	58 4 11	614 8 0	1,205 18 10	230 8 0	...	219 6 10	...
Livingstone	...	...	293 8 0	542 1 0	170 0 6	...	168 11 4	...
Torphichen	...	...	398 8 0	765 5 9	179 8 0	38 9 3	...	...
Uphall	...	16 2 10	697 12 0	2,156 1 3	392 8 0	91 5 11	...	8 5 11
Whitburn	146 16 7	58 13 3	669 12 0	1,323 2 5	254 9 6	31 18 5	244 17 9	...
Total of Linlithgow	1,966 10 3	172 10 6	5,533 12 0	11,669 12 4	2,510 14 6	355 9 11	1,313 8 1	8 5 11
NAIRN.								
Ardclach	...	...	59 8 0	173 10 6	62 5 6	...	...	...
Auldearn	27 13 2	...	111 0 0	245 18 9	111 12 6	...	...	...
Cawdor	...	...	91 16 0	226 0 3	34 8 6	14 17 3	...	...
Nairn (B.)	...	...	408 12 0	862 16 7	153 4 6	20 15 6	163 2 10	...
Nairn (L.)	...	...	93 0 0	178 17 3	61 1 8	...	...	...
Total of Nairn	27 13 2	...	763 16 0	1,687 3 4	422 12 8	35 12 9	163 2 10	...
ORKNEY.								
Birsay and Harray	38 8 1	...	121 4 0	288 9 11	175 9 0	...	...	...
Cross and Burness and North Ronaldshay	105 15 6	...	70 16 0	179 2 9	116 11 0	14 7 0	7 15 10	...
Eday	...	...	46 4 0	141 15 1	17 6 6	...	18 3 6	...
Evie and Rendall	4 6 11	...	84 12 0	236 2 6	71 14 6	...	19 1 6	...
Firth and Stenness	...	...	101 8 0	262 12 0	38 0 6	...	42 19 6	...
Holm	12 4 2	...	53 8 0	148 0 0	20 0 6	...	17 17 5	...
Hoy and Græmsay	...	...	39 12 0	137 11 6	14 17 0	...	30 17 2	...
Kirkwall (B.)	261 14 4	...	* ...	...	...	...	...	...
Kirkwall (Comb.)	...	2 17 9	371 8 0	1,235 6 10	139 5 6	...	89 17 5	...
Kirkwall (L.) and St. Ola	77 8 2	...	* ...	...	...	...	...	...
Lady	...	...	79 4 0	240 14 9	109 14 0	...	36 5 1	...
Orphir	...	...	82 4 0	220 4 6	80 16 6	16 15 7	20 14 2	...
Rousay and Egilshay	...	...	55 16 0	201 19 3	60 18 6	...	12 17 10	...
St. Andrews and Deerness	...	...	113 8 0	334 8 3	42 10 6	...	42 17 5	...
Sandwick	176 17 3	...	71 8 0	195 15 3	126 15 6	...	...	...
Shapinsay	...	...	50 8 0	145 14 3	68 18 0	...	47 6 6	...
South Ronaldshay and Burray	...	4 4 0	219 0 0	577 9 0	202 2 6	10 3 10	114 1 1	...
Stromness	...	3 6 8	210 12 0	681 19 6	118 19 6	...	65 8 4	...
Stronsay	...	...	106 16 0	279 16 9	40 1 0	...	7 4 4	...
Walls and Flotta	...	...	95 8 0	270 7 9	195 15 6	...	52 17 2	...
Westray and Papa Westray	41 0 8	...	150 12 0	401 13 3	96 9 6	...	106 14 1	...
Total of Orkney	717 15 1	10 8 5	2,123 8 0	6,179 3 1	1,736 5 6	41 6 5	732 18 4	...
PEEBLES.								
Drumelzier	...	...	15 0 0	41 12 0	5 12 6	...	...	...
Eddlestone	49 7 5	...	43 16 0	90 4 0	16 8 6	...	...	...
Innerleithen	38 10 0	8 12 7	336 0 0	676 11 5	126 0 0	44 17 8	...	...
Kilbucho, Broughton, and Glenholm	30 19 6	...	42 12 0	103 11 0	65 19 6	...	...	...

* No school under the Board.

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	380 0 0	5	...	...	...	2 6 0	629 1 5	...	17,351
...	700 0 0	8⅜	...	...	...	1 0 6	947 3 5	25 9 11	20,040
...	...	...	...	...	593 14 0	..	1,713 19 10	2,563 12 7	...
...	1,900 0 0	10⅜	...	...	141 7 6	5 7 8	5,500 0 6	322 4 7	40,677
216 6 2	3,850 0 0	1/5¼	4,316 0 0	65 0 0	...	123 9 0	12,816 13 10	2,956 5 2	54,300
...	606 2 5	3	...	30 0 0	...	0 2 0	1,815 0 4	...	48,827
...	275 0 0	5⅛	...	...	...	...	488 3 4	..	12,916
...	...	...	...	...	50 11 7	...	134 13 2	...	...
...	2,000 0 0	1/1	...	...	...	20 10 2	3,787 0 5	...	38,834
...	1,970 0 0	1/¼	...	...	...	314 18 4	4,613 4 11	854 15 4	31,387
...	900 0 0	1/5⅝	...	..	...	2 7 1	2,076 7 11	...	13,135
...	1,050 0 0	1/5	...	...	...	3 9 0	2,435 0 0	255 4 7	15,507
...	2,500 0 0	1/1¼	...	...	...	†38 1 2	5,899 17 1	...	58,250
...	1,600 0 0	1/0½	...	...	...	9 10 0	4,338 19 11	0 1 6	30,693
216 6 2	17,731 2 5	...	4,316 0 0	95 0 0	785 13 1	521 0 11	47,195 6 1	6,977 13 8	381,917
...	225 0 0	1/	...	66 10 0	...	...	586 14 0	114 13 6	4,464
...	330 0 0	1/	...	...	...	0 2 6	826 6 11	...	7,733
...	300 0 0	1/	...	...	...	...	667 2 0	283 12 5	6,546
...	550 0 0	9⅞	...	5 15 8	...	5 14 7	2,170 1 8	34 7 0	15,395
...	250 0 0	5⅝	...	...	..	0 2 6	583 1 5	2 1 10	9,733
...	1,655 0 0	...	...	72 5 8	...	5 19 7	4,833 6 0	434 14 9	43,871
...	163 6 0	9¼	...	...	7 10 0	1 10 0	795 17 0	...	3,457
...	206 17 7	11	...	...	...	31 8 0	732 13 8	...	4,087
..	75 0 0	1/1½	...	30 0 0	...	1 0 0	329 9 1	86 8 2	1,373
...	102 0 0	‡	...	...	...	0 10 8	518 8 1	...	2,374
...	93 2 9	8	...	...	...	0 2 0	538 4 9	103 1 6	2,719
...	125 0 0	1/4	...	3 15 4	...	1 6 8	381 12 1	...	1,833
...	60 0 0	2/1	...	...	...	...	282 17 8	56 19 11	726
...	505 0 0	1/	...	...	...	30 0 0	796 14 4	...	10,853
160 0 0	...	...	...	...	426 12 5	66 14 5	2,492 2 4	426 14 5	...
...	120 0 0	8	...	...	...	...	197 8 2	...	3,877
...	112 7 6	11	...	...	59 18 8	1 8 0	639 12 0	14 0 5	2,281
...	37 15 3	4	...	14 10 0	..	...	473 0 0	140 15 9	2,067
...	117 2 0	10½	...	25 0 0	...	0 0 9	473 14 4	113 2 10	2,641
...	80 0 0	5¼	...	50 0 0	...	...	663 4 2	292 5 10	3,042
...	66 0 0	5	...	...	...	...	636 16 0	...	2,683
...	65 7 9	1/0½	...	...	...	...	377 14 6	...	1,654
...	155 0 0	8	...	180 0 0	...	11 0 0	1,473 0 5	101 14 8	4,595
90 0 0	340 0 0	1/1½	2,150 0 0	...	...	65 5 7	3,725 11 7	428 18 0	8,239
...	245 0 0	1/5¼	...	40 0 0	...	1 17 1	720 15 2	7 15 11	3,979
...	110 0 0	11⅛	...	...	...	...	724 8 5	75 1 0	2,158
...	220 0 0	1/3	217 0 0	...	...	8 17 7	1,242 7 1	31 11 2	3,568
250 0 0	2,998 18 10	...	2,367 0 0	343 5 4	494 1 1	221 0 9	18,215 10 10	1,878 9 7	68,506
..	128 0 0	6⅜	...	0 11 0	..	...	190 15 6	...	4,555
...	230 14 5	6	...	...	..	5 10 0	436 0 4	...	9,432
...	1,150 0 0	1/5	...	...	...	2 0 0	2,382 11 8	70 19 0	17,277
...	165 0 0	2¾	...	...	...	0 12 6	408 14 6	...	14,825

* Rents, £20 19s. † Rents, £19. ‡ Owners, 4½d. no Rate on Occupiers. § Owners, 4d.; no Rate on Occupiers

General Abstract of Statements of Income, Expenditure, and Liabilities

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(*a*) Annual Grants and Drawing Grants.	(*b*) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
PEEBLES—*contd.*								
Kirkurd	1 9 9	...	28 16 0	58 10 0	50 16 0	...	...	...
Lyne	11 8 7	...	21 12 0	51 12 0	8 2 0	...	19 19 7	...
Manor	7 13 10	...	25 16 0	61 17 0	9 13 6	...	...	...
Newlands	101 12 7	...	50 8 0	117 2 0	108 18 0	...	...	...
Peebles (including B.)	293 10 6	40 7 8	403 16 0	844 13 10	151 8 6	...	...	...
Skirling	6 10 9	...	23 8 0	54 2 0	58 15 6	...	...	...
Stobo	20 7 11	...	22 4 0	52 12 0	8 6 6	...	...	...
Traquair	24 1 5	...	35 8 0	70 3 9	53 5 6	...	...	...
Tweedsmuir	61 4 1	...	25 16 0	59 3 0	9 13 6	...	...	...
West Linton	...	...	57 0 0	128 5 0	61 7 6	9 19 8	...	...
Total of Peebles	646 16 4	49 0 8	1,131 12 0	2,409 19 0	734 7 0	54 17 4	19 19 7	...
PERTH.								
Aberdalgie	12 0 8	...	16 16 0	45 6 9	6 6 0	...	...	...
Aberfoyle	69 3 5	...	117 12 0	229 1 1	84 2 0	...	...	...
Abernethy	15 16 11	2 11 3	85 16 0	167 6 0	64 8 6	23 0 1	...	...
Abernyte	23 10 0	...	47 8 0	94 6 9	57 15 6	...	...	...
Alyth	...	3 5 3	268 4 0	550 17 3	100 11 6	...	...	...
Amulree	44 10 10	2 5 0	19 4 0	71 3 9	9 0 0	7 6 7	...	...
Ardoch	44 6 4	...	64 4 0	114 16 9	64 1 6	9 13 0	...	...
Arngask	...	...	61 16 0	119 2 10	63 3 6	...	...	...
Auchterarder	...	8 18 8	263 8 0	530 11 9	98 15 6	31 18 4	...	53 14 10
Auchtergaven	...	...	105 12 0	202 4 3	39 12 0	...	..	...
Stanley (Comb.)	...	...	103 16 0	404 10 3	40 5 6	6 12 10	...	25 0 0
Balquhidder	51 6 11	...	27 12 0	89 14 3	50 7 0	...	...	...
Lochearnhead (Comb.)	...	...	36 0 0	86 16 9	53 10 0	...	...	...
Bendochy	31 15 7	...	25 4 0	65 18 3	9 9 0	...	...	...
Blackford	...	...	121 4 0	233 18 6	105 9 0	...	...	21 18 8
Blair-Athol	407 15 3	...	84 8 0	156 6 6	51 10 6	8 5 10	...	20 0 0
Blairgowrie	202 7 10	2 2 8	355 16 0	842 7 3	133 8 6	81 14 1	...	107 14 2
Callander	...	85 10 0	169 4 0	314 6 3	113 9 0	...	...	...
Caputh	217 13 9	...	69 0 0	142 10 6	115 4 0	...	...	20 0 0
Cargill	92 9 4	...	122 8 0	253 4 3	45 18 0	...	...	16 5 0
Clunie	13 14 2	...	46 16 0	100 14 3	17 11 0	...	...	...
Collace	...	...	55 16 0	108 17 3	50 18 6	...	...	...
Comrie	...	...	151 4 0	295 16 0	56 14 0	...	...	20 0 0
Coupar-Angus	...	1 0 0	249 0 0	1,058 3 0	92 14 0	47 0 6	...	45 13 0
Crieff	596 7 9	11 10 9	382 16 0	783 16 4	213 11 0	27 8 11	...	...
Dron	...	...	30 12 0	57 6 3	51 9 6	...	...	...
Dull	...	13 2 1	233 8 0	355 1 2	129 11 0	33 3 11	...	45 9 6
Dunbarney	19 8 3	...	72 0 0	158 17 0	27 0 0	...	...	20 0 0
Dunblane and Lecropt	...	10 13 6	284 8 0	609 13 8	157 15 6	121 12 8	...	83 1 0
Dunkeld and Dowally	...	...	117 0 0	271 9 9	73 17 6	3 9 7	...	15 0 0
Dunning	6 13 3	...	108 12 0	211 0 9	40 14 6	9 12 1	...	...
Errol	65 8 3	12 13 4	118 16 0	226 7 6	84 11 0	...	...	20 0 0
Findo-Gask	3 17 1	...	31 4 0	67 16 3	51 14 0	...	...	...
Forgandenny	20 0 5	...	37 4 0	72 3 0	63 19 0	...	...	...
Forteviot	...	...	55 4 0	127 2 6	70 14 0	..	...	20 0 0
Fortingall	15 4 10	...	39 12 0	84 3 0	14 17 0	9 7 10	...	...
Fowlis Wester	59 11 3	...	58 16 0	148 8 0	112 1 0	...	...	...
Gartmore	33 17 7	1 5 0	51 12 0	102 16 0	59 7 0	...	...	20 0 0
Glendevon	...	...	15 0 0	45 10 0	5 12 6	...	...	...
Inchture	20 12 1	...	70 12 0	125 3 6	62 14 6	...	...	...
Innerwick (Glenlyon)	67 10 6	...	28 8 0	51 5 0	8 15 6	...	...	...
Kenmore	...	...	90 0 0	261 5 9	33 15 0	7 9 2	...	...

School Boards for the Year ended the 15th May 1907.—INCOME—*continued*.

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	100 0 0	4½	...	...	5 0 0	...	244 11 9	...	5,335
...	98 0 0	1/10	...	...	...	9 1 10	219 16 0	...	1,176
...	90 0 0	5½	...	20 0 0	...	...	215 0 4	...	4,137
...	250 0 0	7⅜	...	...	...	1 14 0	629 14 7	...	7 582
...	2,100 0 0	1/3 13/14	2,100 0 0	...	...	58 14 10	5,992 11 4	...	35,895
...	110 0 0	10⅞	...	...	...	...	252 16 3	...	2,734
...	121 18 1	5⅞	...	...	...	...	225 8 6	31 7 2	5,200
...	100 0 0	3⅝	...	...	...	...	282 18 8	...	6,465
...	213 2 7	2½	...	...	...	...	368 19 2	...	16,523
16 0 0	350 0 0	6	...	10 0 0	...	12 1 0	644 13 2	149 5 6	17,942
16 0 0	5,206 15 1	...	2,100 0 0	30 11 0	5 0 0	89 14 2	12,494 11 9	251 11 8	149,078
...	50 0 0	2½	...	...	...	...	130 9 5	...	3,809
...	500 0 0	6	2,400 0 0	...	...	25 17 9	3,425 16 3	119 13 7	21,149
...	300 0 0	7⅛	...	...	...	...	658 18 9	...	11,239
...	146 0 0	1/8 1/4	700 0 0	...	20 10 0	...	1,089 10 3	...	2,167
...	730 0 0	8	...	...	...	...	1,652 18 0	155 19 6	22,346
...	157 16 2	4½	...	...	...	0 8 0	311 14 4	...	8,306
...	406 0 9	10	...	...	...	1 6 3	704 8 7	...	11,019
...	250 0 0	9	...	2 4 0	...	*189 0 0	685 6 4	...	6,553
...	1,128 10 5	1/4½	...	...	...	7 10 0	2,123 7 6	161 12 9	18,018
...	400 0 0	9	...	...	0 15 0	2 6 6	750 9 9	80 2 6	12,189
...	...	...	...	...	234 2 4	...	814 6 11	...	...
...	280 0 0	7	...	10 12 0	...	...	509 12 2	...	8,750
...	...	...	...	...	65 1 4	...	241 8 1	...	...
...	115 0 0	3½	...	...	...	...	247 6 10	...	8,095
...	513 14 1	†	...	...	...	...	996 4 3	...	15,190
...	471 8 4	5¼	...	...	...	6 19 7	1,206 14 0	...	20,771
8 0 0	950 0 0	9½	...	...	...	1 11 10	2,685 2 4	...	26,007
...	350 0 0	10¼	1,800 0 0	...	...	...	3,332 9 3	...	19,957
...	207 0 0	6	...	...	...	2 0 7	773 8 10	...	7,752
...	200 0 0	3¾	...	...	...	...	730 4 7	...	12,906
...	160 0 0	7½	...	...	...	...	338 15 5	...	6,186
...	144 0 0	1/2½	...	...	...	1 4 9	360 16 6	63 18 11	3,136
...	606 16 10	7 1/25	...	16 12 4	...	6 0 0	1,153 3 2	78 17 2	20,757
...	825 0 0	1/3¾	...	...	...	0 10 8	2,319 1 2	24 19 6	13,772
10 0 0	1,450 0 0	8½	1,100 0 0	...	...	65 6 8	4,640 17 5	101 14 7	41,615
...	40 0 0	2⅜	...	...	...	...	179 7 9	60 11 4	3,671
70 0 0	1,050 0 0	1/5	3,000 0 0	...	...	‡64 17 9	4,994 13 5	...	15,404
...	215 0 0	5	...	...	...	2 14 4	514 19 7	3 16 1	7,945
...	1,530 0 0	1/1½	...	6 5 4	...	7 15 0	2,811 4 5	...	29,036
...	208 6 1	6½	...	150 0 0	...	1 4 1	840 7 0	608 9 2	7,117
...	252 2 7	5½	207 0 0	...	...	...	835 15 2	...	11,382
...	650 0 0	10¾	...	...	5 2 8	5 4 0	1,188 2 9	...	16,668
...	100 0 0	5⅜	...	...	...	...	254 11 4	...	4,246
...	150 0 0	5½	...	...	...	...	343 6 5	19 2 10	6,420
...	240 0 0	9¼	...	...	...	...	513 0 6	...	7,141
...	174 3 8	⅝	...	...	...	2 10 0	339 18 4	...	3,857
...	138 8 8	2⅜	...	...	10 0 0	9 5 0	536 9 11	102 9 11	11,150
...	264 9 0	3½	...	...	...	...	533 6 7	...	17,480
...	138 5 1	6¼	...	5 0 0	...	4 17 6	214 5 1	...	4,840
...	300 0 0	10¾	...	...	...	2 10 0	571 12 1	...	6,829
...	144 3 1	‖	...	...	...	...	295 2 1	...	4,308
20 0 0	500 0 0	1/3	...	...	...	...	912 9 11	145 6 2	8,424

* Price of Property sold, £187.
† Owners, 4d.; Occupiers, 1¾d., 5¼d.
‡ From Insurance Company for damage by fire, £21 18s.
§ Owners, 5¾d.; Occupiers, 6d., 4d.
‖ Kenmore District—Owners, 4d; Occupiers, 4d. Fortingall District—Owners, 4d.; Occupiers, 4d.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Perth—*contd.*								
Killin	187 5 0	...	105 12 0	256 8 0	129 12 0	...	...	15 0 0
Kilmadock	1 2 5	0 18 0	168 12 0	347 18 0	103 4 6	41 1 5	...	28 12 1
Kilspindie	13 2 3	...	42 0 0	72 16 6	15 15 0	...	...	...
Kincardine	18 10 11	...	100 4 0	199 15 3	127 11 6	...	...	...
Kinclaven	57 17 10	...	19 4 0	48 13 0	7 4 0	...	...	...
Kinfauns	15 12 7	...	48 12 0	106 4 11	18 4 6	...	...	...
Kinloch-Rannoch	24 3 4	4 19 3	59 8 0	175 1 9	72 5 6	4 10 0	...	10 0 0
Kinnaird	1 1 8	...	25 16 0	63 8 3	59 13 6	...	...	...
Kinnoull	20 7 3	...	*...	...	...	..	...	...
Kirkmichael	2 3 4	...	75 0 0	190 7 0	78 2 6	7 2 0	...	20 0 0
Lethendy and Kinloch	3 2 5	...	21 12 0	39 3 6	8 2 0	...	...	...
Little Dunkeld	...	4 8 11	128 8 0	307 8 3	96 16 0	15 3 7	...	20 0 0
Logiealmond	202 19 1	...	63 0 0	129 11 0	63 12 6	...	...	12 15 0
Logierait	52 2 5	...	99 0 0	228 5 0	126 18 0	...	...	20 0 0
Longforgan	287 12 8	12 11 0	155 8 0	288 13 9	88 5 6	...	...	25 0 0
Maderty	...	...	27 0 0	63 19 3	50 2 6	...	...	...
Meigle	...	...	151 16 0	313 16 9	86 18 6	...	...	...
Methven	111 9 2	...	112 4 0	214 7 3	42 1 6	...	...	...
Moneydie	22 19 1	...	16 4 0	33 18 3	6 1 6	...	...	...
Monzievaird and Strowan	48 12 3	...	30 0 0	64 19 9	11 5 0	...	...	...
Moulin	12 9 6	4 7 6	233 8 0	501 13 4	87 10 6	19 9 1	...	45 0 0
Muckhart	21 17 11	...	32 8 0	72 0 3	62 3 0	...	...	9 16 9
Muthill	...	...	106 4 0	220 18 9	69 16 6	...	...	...
Persie	...	2 7 6	34 4 0	115 14 6	102 16 6	17 7 3	...	...
Perth (B.)	...	283 19 5	2,313 12 0	4,984 15 7	897 12 0	1,060 4 8	57 17 0	...
Perth, East Parish (L.)	53 12 3	...	15 4 0	42 16 6	49 0 0	...	...	...
Port of Monteith	...	...	29 8 0	99 13 3	11 0 6	...	...	...
Rattray	...	31 8 5	156 0 0	297 10 6	58 10 0	...	4 3 0	...
Redgorton	25 8 4	...	90 12 0	187 9 6	33 19 6	...	...	20 0 0
Rhynd	26 5 1	...	19 4 0	50 8 9	7 4 0	...	...	...
St Madoes	70 7 2	...	54 12 0	103 18 11	60 9 6	...	...	5 0 0
St Martins	...	...	105 12 0	207 17 9	79 16 6	17 6 6	...	10 0 0
Scone	40 18 4	3 13 3	189 12 0	392 15 6	111 2 0	...	...	...
Tenandry	16 17 7	...	*...	...	...	...	...	...
Tibbermore	...	...	72 0 0	138 17 6	67 0 0	...	...	...
Trinity-Gask	42 6 6	...	24 12 0	60 14 9	49 4 6	...	...	...
Trossachs	...	...	24 12 0	59 13 3	9 4 6	...	...	...
Weem	...	...	14 4 0	42 15 9	44 19 0	...	...	...
Total of Perth	3,515 8 7	503 10 9	9,442 0 0	20,761 15 7	5,779 8 0	1,609 19 11	62 0 0	795 0 0
RENFREW.								
Cathcart	2,208 9 10	160 7 0	1,401 4 0	4,058 19 11	811 16 0	709 11 4	...	85 0 0
Eaglesham	72 15 9	...	80 8 0	150 13 0	27 13 6	...	...	...
Eastwood	...	434 18 0	1,800 0 0	5,029 5 8	710 14 6	353 3 6	265 13 6	236 10 0
Erskine	224 18 7	3 19 0	97 4 0	202 4 3	106 9 0	...	...	...
Gourock	4 9 8	4 14 4	461 8 0	985 7 1	173 0 6	71 3 8	...	...
Greenock (B.)	...	249 8 7	4,492 4 0	10,641 12 1	1,661 8 0	1,847 16 10	...	31 10 0
Greenock, East Parish (L.)	37 5 10	...	202 4 0	441 10 4	75 16 6	...	...	...
Greenock, West Parish (L.)	0 14 2	...	*...	...	...	...	...	...
Houston and Killellan	120 13 1	...	65 8 0	120 17 3	65 13 0	...	...	...

* No school under the Board.

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	700 0 0	10	...	...	...	1 19 2	1,395 16 2	...	17,237
...	700 0 0	9⅛	...	...	...	...	1,391 8 5	...	19,530
...	125 0 0	6 1/12	...	...	...	...	268 13 9	...	4,620
...	287 11 6	6	...	...	...	...	733 13 2	...	13,268
...	240 0 0	7⅜	...	...	...	...	372 18 10	...	7,538
...	260 0 0	7½	...	...	30 16 8	0 0 2	479 10 10	...	8,918
...	565 11 9	*	...	...	...	30 0 0	945 19 7	5 12 9	16,153
...	90 0 0	7¼	...	16 10 9	4 6 11	0 0 2	260 17 3	...	2,195
...	84 0 0	7	...	...	...	...	104 7 3	...	3,214
...	280 0 0	5⅝	...	...	22 11 9	...	675 6 7	...	12,293
...	134 1 5	7	...	...	...	...	206 1 4	...	5,343
...	544 6 1	8¼	...	...	37 18 3	0 4 3	1,154 13 4	14 1 3	15,494
...	175 0 0	9	...	...	22 10 0	6 14 3	676 1 10	...	4,963
...	429 13 8	6⅝	...	...	...	3 12 2	959 11 3	...	16,733
...	538 11 4	10 7/10	700 0 0	...	...	22 4 11	2,118 7 2	...	13,672
...	79 6 0	3⅜	...	...	...	...	220 7 9	...	6,291
...	402 5 6	9⅜	...	...	...	5 15 0	960 11 9	98 3 5	10,471
...	144 14 8	2¾	...	...	...	...	624 16 7	77 13 10	11,653
...	120 0 0	9 1/16	...	...	...	...	199 2 10	...	3,174
...	197 8 0	4⅝	...	16 12 4	...	...	368 17 4	...	9,411
9 0 0	964 13 7	9⅝	...	...	...	...	1,877 11 6	68 0 3	25,260
...	150 0 0	6	...	11 15 10	...	1 0 0	361 1 9	...	5,044
...	328 16 4	7	...	...	..	15 6 0	741 1 7	20 7 2	12,861
...	355 10 9	1/	...	...	32 9 0	0 13 4	661 2 10	172 1 7	7,869
...	10,340 12 7	1/2	...	...	20 0 0	100 17 1	20,059 10 4	1,373 9 11	183,153
...	61 2 5	2½	...	...	15 0 0	3 5 4	240 0 6	...	5,426
...	315 7 10	10	...	...	...	0 3 0	455 12 7	...	8,339
...	475 0 0	10	...	...	...	12 10 6	1,035 2 5	135 19 11	11,801
...	355 0 0	9	...	...	...	6 5 0	718 14 4	37 15 5	9,755
...	80 0 0	4	...	...	...	...	183 1 10	63 16 6	4,536
...	130 0 0	8	...	...	5 0 7	...	429 8 2	...	4,882
...	280 0 0	8⅜	...	...	1 0 0	3 0 0	704 12 9	37 18 9	7,843
...	610 0 0	1/0⅜	...	...	...	0 15 0	1,348 16 1	...	13,377
...	...	...	...	...	...	...	16 17 7	...	4,042
...	400 0 0	5⅝	...	...	...	...	677 17 6	32 10 0	18,272
...	76 4 1	3½	...	...	...	...	253 1 10	...	5,196
...	246 5 7	6½	...	...	...	...	339 15 4	21 10 2	9,138
...	200 0 0	11½	...	...	...	...	301 18 9	...	4 301
117 0 0	38,402 7 10	...	9,907 0 0	235 12 7	527 4 6	625 5 7	92,283 13 4	3,885 14 11	1,030,874
350 0 0	13,600 0 0	1/2⅝	12,400 0 0	...	...	202 9 4	35,987 17 5	...	227,637
...	457 9 9	9	...	50 2 7	...	...	839 2 7	...	14,197
...	6,000 0 0	1/2¼	3,140 0 0	...	...	...	17,970 5 2	...	104,597
...	750 0 0	11⅜	...	...	...	7 16 5	1,392 11 3	...	16,124
...	1,750 0 0	†	...	...	...	...	3,450 3 3	...	45,126
350 0 0	16,600 0 0	‡	3,000 0 0	13 0 0	30 0 0	112 18 7	39,029 18 1	...	311,057
...	807 0 0	§	...	...	...	2 3 9	1,566 0 5	...	19,128
...	57 0 0	‖	...	...	...	...	57 14 2	...	7,180
...	480 0 0	10	...	...	58 6 2	5 0 0	915 17 6	...	11,704

* Owners, 4½d.; Occupiers, 4½d., 3d., 1½d.
† Owners, 4⅜d.; Occupiers, 5d., 4 1/10d., 1⅜d.
‡ Owners, 6⅜d.; Occupiers, 5⅝d., 1½d., 1/11½d., 1/5⅜d., 11⅜d.
§ Owners, 4½d.; Occupiers, 3½d., ⅝d., 1s. 2d., 10½d., 7d.
‖ Owners, ¼d.; Occupiers, ½d., ⅛d., 1½d., 1d., 2d.

General Abstract of Statements of Income, Expenditure, and Liabilties of

School Board and County	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(*a*) Annual Grants and Drawing Grants.	(*b*) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Renfrew—*contd.*								
Inchinnan	95 5 2	...	36 0 0	120 18 0	113 10 0	...	...	...
Inverkip	...	2 9 0	54 12 0	106 4 9	60 9 6	28 11 0	...	...
Kilbarchan	199 2 10	3 15 0	508 16 0	1,145 9 10	207 4 6	328 3 6	...	6 10 0
Kilmalcolm	125 4 10	3 15 0	223 16 0	463 14 3	83 18 6	9 10 7	...	...
Levern	94 11 6	...	139 16 0	252 10 9	52 8 6	34 7 4	...	...
Lochwinnoch	...	...	331 4 0	654 3 10	124 4 0	87 17 6	...	9 14 9
Mearns	...	35 15 6	183 12 0	394 9 10	68 17 0	18 4 5	...	...
Busby (Comb.)	...	...	187 4 0	377 15 5	70 4 0	...	...	...
Neilston	...	25 18 6	1,242 12 0	2,520 18 2	493 7 6	456 2 0	808 12 0	2 10 0
Paisley (B.)	...	279 18 0	5,913 12 0	13,498 1 6	2,320 4 0	1,272 14 9	1,770 14 3	26 10 0
Paisley (L.)	1,224 13 3	59 4 8	1,358 8 0	2,712 18 7	589 3 6	283 19 0	...	...
Port-Glasgow (B.)	357 14 9	67 4 9	1,189 16 0	1,969 9 4	446 3 6	319 14 4	439 14 4	54 10 0
Renfrew (B.)	...	105 17 4	679 16 0	1,340 6 0	254 18 6	37 3 9	758 13 2	...
Renfrew (L.)	521 19 1	88 10 9	1,339 4 0	2,581 6 1	502 4 0	195 14 1	208 3 6	...
Total of Renfrew	5,287 18 4	1,525 15 5	21,988 8 0	49,768 15 11	9,019 8 0	6,053 17 7	4,251 10 9	452 14 9
ROSS AND CROMARTY.								
Mainland.								
Alness	...	...	84 12 0	226 9 6	71 19 0	...	...	...
Applecross	9 7 6	...	148 16 0	442 6 3	175 16 0	...	70 6 5	...
Avoch	75 9 8	...	130 4 0	307 4 2	102 4 0	...	33 17 4	...
Carnoch	61 16 1	...	12 12 0	43 11 0	4 14 6	...	...	...
Contin	24 13 8	...	26 8 0	73 6 0	49 18 0	...	...	...
Cromarty (including B.)	...	...	245 16 0	550 15 2	110 8 6	...	64 19 9	...
Dingwall (including B.)	8 0 11	79 0 6	304 16 0	1,170 10 9	114 6 0	...	124 4 6	75 0 0
Edderton	5 4 7	...	51 12 0	122 8 0	49 7 0	6 3 11	...	...
Fearn	...	...	200 8 0	491 10 0	155 3 0	..	56 9 5	...
Fodderty	...	...	123 12 0	286 2 6	87 0 6	11 2 1	...	...
Gairloch	...	0 15 0	301 16 0	816 1 0	293 3 5	...	164 7 8	...
Glenshiel	...	...	25 16 0	92 7 3	9 13 6	...	...	...
Killearnan	5 15 11	...	66 12 0	183 14 10	64 19 6	..	...	...
Kilmuir-Easter	...	...	125 4 0	279 11 7	147 2 6	...	58 4 0	...
Kiltearn	...	...	100 4 0	273 3 4	70 14 6	...	...	...
Kincardine	90 14 6	...	89 17 0	258 2 9	73 19 6	...	...	...
Kinlochluichart	152 18 3	...	39 12 0	140 12 9	14 17 0	...	...	...
Kintail	73 8 1	...	51 0 0	146 15 9	69 2 6	...	...	...
Knockbain	...	...	119 8 0	549 19 2	246 11 6	...	4 1 4	...
Lochalsh	...	...	163 16 0	474 17 0	231 8 6	...	46 6 11	...
Lochbroom	...	2 10 5	234 12 0	717 7 11	277 19 6	...	87 6 5	...
Lochcarron	2 8 9	...	118 4 0	346 6 3	164 6 6	...	18 11 1	...
Logie-Easter	72 8 9	...	57 12 0	224 15 9	142 10 0	...	34 18 6	...
Nigg	...	...	40 8 0	175 2 3	22 14 6	...	...	...
Resolis	...	...	81 12 0	211 14 6	100 12 0	...	21 9 8	...
Rosemarkie	...	...	149 8 0	465 9 10	86 0 6	...	83 14 3	...
Rosskeen	...	...	343 16 0	1,098 3 2	208 18 6	21 1 8	180 7 6	50 0 0
Tain (including B.)	...	...	197 8 0	443 3 0	114 0 6	...	...	...
Tarbat	...	...	146 8 0	382 8 6	94 18 0	...	20 3 1	...
Urquhart and Logie-Wester	162 17 0	...	163 4 0	395 19 3	193 9 0	...	47 4 2	...
Urray	...	...	137 8 0	321 17 3	121 10 6	...	...	...
Insular.								
Barvas	406 2 4	...	393 4 0	1,339 14 2	221 3 6	...	486 15 10	...
Lochs	101 10 6	...	458 8 0	1,141 3 10	173 5 0	...	308 6 2	...
Achmore (Comb.)	...	...	24 12 0	64 13 6	9 4 6	...	...	...
Stornoway	...	6 7 11	1,280 16 0	3,658 13 5	540 7 6	...	886 16 7	75 0 0
Uig	...	...	424 4 0	1,091 18 3	200 8 6	...	755 5 1	...
Total of Ross and Cromarty	1,252 16 6	88 13 10	6,663 5 0	19,007 19 7	4,813 17 6	38 7 8	3,553 15 8	200 0 0

School Boards for the Year ended the 15th May 1907.—Income—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	200 19 11	*	...	...	...	...	566 13 1	...	5,679
...	230 0 0	†	...	...	...	2 15 5	485 1 8	114 17 4	8,588
...	1,900 0 0	11$\frac{11}{16}$	1,050 0 0	...	54 0 0	5 3 2	5,408 4 10	...	42,026
45 0 0	1,250 0 0	6$\frac{6}{8}$	...	...	...	55 1 4	2,260 0 6	...	45,260
...	704 15 0	‡	...	...	...	10 9 5	1,288 18 6	...	14,463
...	1,400 0 0	1/0$\frac{15}{32}$	...	...	...	4 2 9	2,611 6 10	1,290 5 1	29,418
...	1,200 0 0	1/2	...	...	9 5 2	1 17 6	1,912 1 5	247 9 5	22,466
...	...	...	...	...	673 13 11	6 6 7	1,315 3 11	312 15 5	...
120 0 0	4,700 0 0	§	...	...	217 7 5	13 12 5	10,601 0 0	...	60,377
200 0 0	18,600 0 0	‖	...	...	...	71 11 5	43,953 5 11	4,392 9 1	319,244
...	4,300 0 0	¶	7,000 0 0	...	...	44 14 0	17,573 1 0	...	95,207
90 0 0	3,880 0 0	1/5	...	35 0 0	175 0 0	73 15 5	9,098 2 5	...	58,214
...	1,100 0 0	1/3$\frac{7}{10}$	...	223 11 0	...	1 6 8	4,501 12 5	...	18,430
...	4,800 0 0	1/1$\frac{3}{10}$	...	...	110 17 6	86 8 9	10,434 7 9	...	84,395
1,155 0 0	84,767 4 8	...	26,590 0 0	321 13 7	1,328 10 2	707 12 11	213,218 10 1	6,357 16 4	1,560,517
...	350 0 0	1/1$\frac{3}{4}$	...	...	...	...	733 0 6	...	5,926
...	250 0 0	1/0$\frac{1}{2}$	...	...	19 5 4	5 12 0	1,121 9 6	...	4,361
...	220 0 0	9$\frac{1}{4}$	...	...	...	4 2 0	873 1 2	...	5,755
...	87 11 4	6	...	...	...	...	210 4 11	...	3,286
...	227 4 3	1/3	...	...	...	...	401 9 11	...	3,833
...	300 0 0	10$\frac{1}{2}$	577 0 0	...	...	...	1,848 19 5	337 3 4	6,849
107 0 0	520 0 0	10	355 0 0	...	...	2 17 6	2,860 16 2	81 3 11	13,989
...	160 1 8	8	...	...	...	...	394 17 2	...	4,622
...	219 1 3	7$\frac{7}{10}$	...	...	...	3 15 0	1,126 6 8	150 0 2	7,146
...	370 0 0	7	...	...	...	...	877 17 1	...	13,212
...	800 0 0	1/6$\frac{1}{2}$	...	...	...	37 15 10	2,413 19 0	...	10,635
...	135 0 0	10$\frac{1}{2}$	...	...	...	3 0 0	265 16 9	41 11 0	2,965
...	194 3 9	1/	...	...	...	...	515 6 0	...	4,475
...	350 0 0	1/8	...	...	...	...	960 2 1	...	5,155
...	270 0 0	8$\frac{3}{4}$	...	...	...	11 13 4	725 15 2	...	8,014
...	600 0 0	1/1	...	...	...	28 0 0	1,140 13 9	...	11,681
...	311 17 6	7$\frac{1}{2}$	...	...	...	30 0 0	689 17 6	...	9,970
...	120 0 0	5	...	...	28 17 9	...	489 4 1	...	4,388
...	350 0 0	1/1	...	...	...	...	1,270 0 0	24 19 3	7,055
80 0 0	450 0 0	1/4$\frac{1}{2}$	...	...	...	...	1,446 8 5	71 8 2	6,842
80 0 0	900 0 0	1/6$\frac{1}{2}$	960 0 0	...	...	48 19 9	3,308 16 0	...	11,932
...	400 0 0	1/2	...	...	...	...	1,049 16 7	41 11 1	6,833
...	230 0 0	1/	...	...	...	...	762 5 0	53 13 0	4,415
...	200 0 0	9	200 0 0	...	...	...	638 4 9	341 15 1	5,129
...	199 17 6	1/0$\frac{1}{4}$	...	...	...	2 0 0	617 5 8	10 10 8	4,529
47 0 0	650 0 0	1/10$\frac{1}{2}$	...	70 0 0	...	...	1,551 12 7	...	7,763
67 0 0	800 0 0	1/3$\frac{1}{2}$	...	...	...	65 14 6	2,835 1 4	136 9 7	12,922
...	600 0 0	1/1	...	...	...	12 19 9	1,367 11 3	...	12,109
...	163 3 3	7	500 0 0	...	...	...	1,307 0 10	16 0 10	5,773
...	400 0 0	1/1$\frac{1}{2}$	...	...	...	11 17 6	1,374 10 11	...	7,198
...	350 0 0	6	...	...	...	...	930 15 9	24 10 10	11,151
...	66 14 6	1	...	...	...	**135 12 5	3,049 6 9	28 7 0	2,762
...	106 3 4	4	...	...	...	††421 6 2	2,710 3 0	. .	3,001
...	...	...	...	...	45 0 0	...	143 10 0	...	...
272 0 0	1,400 0 0	1/10$\frac{1}{2}$	...	1 5 10	...	‡‡6,503 6 0	14,624 13 3	...	16,186
...	380 0 0	2/5	...	...	...	§§204 1 5	3,055 17 3	242 15 3	4,598
653 0 0	13,130 18 4	...	2,592 0 0	71 5 10	93 3 1	7,532 13 2	59,691 16 2	1,601 19 2	256,460

* Owners, 4$\frac{1}{4}$d.; Occupiers, 1$\frac{1}{2}$d., 4$\frac{1}{4}$d. † Owners, 3$\frac{1}{2}$d.; Occupiers, 4d., 3$\frac{3}{4}$d., 1$\frac{7}{10}$d. ‡ Eastwood District—Owners, 5$\frac{7}{20}$d.; Occupiers, 5$\frac{1}{2}\frac{3}{0}$d. Paisley District—Owners, 6$\frac{1}{2}$d.; Occupiers, 1s. 3d., 8d., 6d., 4$\frac{1}{2}$d., 2$\frac{1}{2}$d.
§ Owners, 10d.; Occupiers, 1/0$\frac{1}{10}$d., 10$\frac{3}{4}$d., 3$\frac{3}{4}$d. ‖ Owners, 7d.; Occupiers, 2s. 2d., 1s. 5d., 9d., 6$\frac{1}{2}$d., 5d., 2$\frac{3}{4}$d.
¶ Owners, 5$\frac{3}{4}$d.; Occupiers, 1s. 6d., 1s., 6$\frac{3}{4}$d., 5$\frac{1}{4}$d., 3$\frac{3}{4}$d., 1$\frac{1}{2}$d. ** Grant from Department under Minutes of 4th March 1895, and 19th May 1906, £100. †† Grant from Department under Minutes of 4th March 1895, and 19th May 1906, £350. ‡‡ Grant from Department towards erection and equipment of Nicolson Institute, £6,400. §§ Grant from Department under Minutes of 4th March 1895, and 19th May 1906, £200.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
ROXBURGH.								
Anerum	...	...	78 12 0	179 19 0	109 9 6	21 14 4	...	...
Bedrule	34 0 2	...	18 12 0	42 19 9	4 14 6	...	...	...
Bowden	...	2 4 7	50 8 0	112 10 9	68 18 0	...	...	...
Castleton	...	...	135 0 0	438 2 3	123 2 6	...	...	...
Cavers and Kirkton	...	2 9 2	82 4 0	197 1 3	151 1 0	...	...	...
Crailing	...	...	29 8 0	50 4 0	111 0 6	...	...	...
Eckford	29 17 10	...	37 16 0	61 8 10	14 8 0	...	...	...
Edgerston	...	...	19 16 0	57 6 10	8 2 0	...	...	...
Ednam	...	...	56 8 0	127 19 7	61 3 0	...	...	...
Hawick (B.)	...	135 4 3	1,426 16 0	2,908 18 9	535 1 0	436 12 4	506 5 3	...
Hawick (L.)	36 16 10	...	72 12 0	171 10 9	124 0 0	...	...	...
Hobkirk	3 4 11	...	42 0 0	85 18 9	54 17 0	...	...	...
Hownam	33 1 1	...	9 0 0	30 6 0	3 7 6	...	...	...
Jedburgh (B.)	...	...	264 12 0	616 19 6	99 4 6	...	95 1 6	...
Jedburgh (L.)	77 5 0	...	45 12 0	95 14 0	54 2 6	...	...	...
Kelso	61 19 10	17 3 3	294 12 0	623 9 4	110 9 6	34 11 11	...	...
Lilliesleaf	94 15 10	...	55 16 0	105 3 0	20 16 6	...	...	...
Linton	48 4 1	...	30 12 0	103 4 0	91 0 6	...	...	...
Makerstoun	2 8 4	...	27 12 0	47 12 0	50 7 0	...	...	...
Maxton	25 7 7	...	21 12 0	50 12 0	48 2 0	...	...	...
Melrose	80 16 7	...	324 12 0	680 10 5	153 10 6	...	...	...
Minto	78 9 4	...	42 12 0	87 4 0	53 5 6	...	...	...
Morebattle	155 6 8	...	59 8 0	126 13 9	62 14 6	...	...	...
Oxnam	...	...	37 4 0	150 4 9	113 1 0	...	...	...
Roberton	1 16 6	...	40 4 0	101 8 3	55 1 6	...	...	...
Roxburgh	110 1 3	...	86 8 0	172 6 6	122 8 0	...	...	...
St Boswells	...	...	39 0 0	77 10 9	54 12 6	...	...	...
Smailholm	...	...	36 12 0	62 12 0	63 14 6	...	...	...
Southdean	81 6 4	...	45 12 0	167 1 6	118 13 6	...	...	...
Sprouston	147 8 2	...	50 0 0	139 8 0	128 16 0	...	...	...
Teviothead	...	...	39 12 0	104 4 0	53 19 0	...	...	...
Yetholm	127 14 7	...	76 4 0	277 17 5	28 2 6	...	...	...
Total of Roxburgh	1,230 0 11	157 1 3	3,736 8 0	8,254 1 8	2,851 8 0	492 18 7	601 6 9	...
SELKIRK.								
Ashkirk	...	2 10 6	31 4 0	126 17 6	110 2 6	...	...	...
Caddonfoot	14 10 1	...	42 0 0	85 16 9	15 15 0	...	...	...
Ettrick	...	...	21 12 0	67 10 6	8 2 0	...	...	...
Galashiels (B.)	349 18 0	136 19 9	1,023 0 0	2,151 6 7	383 12 6	517 9 2	541 18 9	...
Galashiels (L.)	33 10 4	...	15 12 0	38 5 6	5 17 0	...	...	...
Kirkhope	18 6 6	1 14 9	36 0 0	113 12 0	65 1 6	...	...	...
Selkirk (B.)	...	13 7 1	422 8 0	779 6 3	158 8 0	107 18 4	125 2 2	20 0 0
Selkirk (L.)	...	...	103 4 0	189 9 3	38 14 0	...	...	...
Yarrow	...	2 13 2	46 4 0	153 17 9	68 0 0	...	...	...
Total of Selkirk	416 4 11	157 5 3	1,741 4 0	3,706 2 1	853 12 6	625 7 6	667 0 11	20 0 0
SHETLAND.								
Bressay	...	...	58 16 0	157 1 9	22 1 0	...	43 13 2	...
Delting	48 15 3	...	79 4 0	222 18 6	29 14 0	...	69 15 4	...
Dunrossness	...	13 19 7	321 0 0	758 6 9	120 7 6	44 1 7	180 8 6	...
Fetlar	7 0 4	...	23 8 0	60 10 6	8 15 6	...	30 8 7	...
Lerwick	...	...	561 18 0	1,597 19 6	206 6 6	...	214 2 7	...

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	260 0 0	5⅝	...	...	...	0 2 6	649 17 4	38 9 2	10,587
...	120 6 7	1/0¼	...	...	...	...	220 13 0	...	2,933
...	285 0 0	1/0⅝	...	...	...	...	519 1 4	55 12 0	5,800
...	680 0 0	7½	...	...	...	4 18 4	1,441 3 1	141 17 10	23,007
...	550 0 0	8 1/10	...	...	...	10 10 0	993 5 5	20 5 1	14,785
...	199 16 5	6 2/10	...	...	...	...	390 8 11	...	6,840
...	225 0 0	6 1/10	...	...	...	...	368 10 8	...	8,337
...	119 13 11	11⅗	...	...	...	...	204 18 9	4 11 0	4,268
...	225 2 3	10	...	...	...	...	470 12 10	101 15 2	6,081
...	2,750 0 0	11 1/10	...	...	...	34 17 8	8,733 15 3	...	58,757
...	450 0 0	8⅛	...	...	...	0 9 0	855 8 7	...	13,229
...	200 0 0	6*	...	...	...	0 16 0	386 16 8	...	7,417
...	150 0 0	9½	...	...	...	...	225 14 7	...	4,401
...	810 0 0	1/4	1,550 0 0	...	52 0 0	...	3,487 17 6	...	12,320
...	225 0 0	3½	...	...	...	0 1 0	497 14 6	...	13,124
...	1,000 0 0	9⅛	...	...	...	23 10 0	2,165 15 10	...	26,557
...	260 0 0	1/0⅝	...	...	...	...	536 13 4	23 11 4	5,622
...	100 0 0	2½	...	...	...	...	373 0 7	...	5,135
...	95 0 0	6 7/10	...	...	...	...	222 19 4	0 5 0	4,120
...	130 0 9	4⅘	...	...	...	...	275 14 4	...	6,178
20 0 0	1,300 0 0	9½	...	2 7 2	...	18 4 11	2,580 1 7	...	36,299
...	225 0 0	10 7/10	...	...	...	*49 18 4	536 9 2	...	5,275
...	250 0 0	6 2/10	...	50 0 0	...	0 7 6	704 10 5	...	8,882
...	250 0 0	9 7/8	...	...	23 9 4	...	573 19 1	21 5 8	7,871
...	165 0 0	3¾	...	...	...	...	363 10 3	...	7,303
...	250 0 0	5½	150 0 0	...	...	2 8 3	893 12 0	...	10,596
...	164 19 4	4⅝	...	...	...	1 13 9	337 16 4	44 1 2	8,674
...	120 0 0	8 1/3	...	...	...	0 13 4	283 11 10	11 1 0	4,259
...	151 19 4	4 7/10	...	...	...	1 12 10	566 5 6	...	6,710
...	280 0 0	6¾	...	...	5 16 7	...	751 8 9	...	10,093
...	160 0 0	4 7/12	...	...	...	13 3 0	370 18 0	50 10 2	7,597
...	310 0 0	1/5½	...	...	...	0 1 2	819 19 8	...	5,025
20 0 0	12,461 18 7	...	1,700 0 0	52 7 2	81 5 11	163 7 7	31,802 4 5	513 4 7	358,082
...	100 0 0	3¼	...	...	...	...	370 14 6	36 15 7	5,369
...	159 11 9	4	...	...	...	12 15 0	330 8 7	...	9,662
...	342 19 11	11	...	...	...	...	440 4 5	192 4 4	7,753
...	3,400 0 0	1/7	...	...	23 5 0	†16,275 0 0	24,802 9 9	...	51,160
...	85 0 0	4	...	...	...	...	178 4 10	...	5,323
...	160 0 0	7	...	...	...	0 15 0	395 9 9	...	5,223
...	1,100 0 0	11⅔	...	40 0 0	...	23 0 5	2,789 10 3	86 17 1	23,129
...	410 0 0	8¼	...	...	...	0 6 2	741 13 5	...	11,925
25 0 0	350 0 0	8 5/6	...	...	16 0 0	18 0 0	679 14 11	109 17 3	9,866
25 0 0	6,107 11 8	...	...	40 0 0	39 5 0	16,329 16 7	30,728 10 5	425 14 3	129,410
..	60 0 0	1/4	...	...	...	...	341 11 11	13 4 11	1,018
...	150 0 0	1/8	...	...	...	...	600 7 1	20 6 1	1,610
...	80 0 0	6	...	...	...	...	1,518 3 11	89 18 8	2,379
...	27 0 0	1/	...	...	...	0 3 0	157 5 11	...	616
250 0 0	650 0 0	9¼	...	210 0 0	...	107 16 3	3,798 2 10	1,217 13 1	16,797

* From Heritors. £48 15s. † Grant from Department towards erection of South of Scotland Central Technical School, £8,000. Subscriptions received for erection of South of Scotland Central Technical School, £8,242 6s.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Shetland—*contd.*								
Nesting, Lunnasting, Whalsay, and Skerries	...	...	147 0 0	362 9 3	55 2 6	52 18 2	120 9 5	...
Northmavine	43 12 6	0 7 9	108 12 0	306 2 9	125 14 6	...	72 16 6	...
Sandsting and Aithsting	136 17 6	...	145 16 0	394 11 3	54 13 6	...	113 5 11	...
Tingwall, Whiteness, and Weisdale.	109 7 5	...	166 16 0	460 1 3	62 11 0	...	95 7 7	...
Unst	...	...	90 0 0	199 4 0	33 15 0	...	23 14 11	...
Walls, Sandness, Papa, and Foula.	109 18 4	...	131 8 0	330 8 8	89 5 6	...	89 10 3	...
Yell	...	4 7 11	163 16 0	455 12 0	61 8 6	...	206 17 1	...
Total of Shetland	455 11 4	18 15 3	1,997 14 0	5,305 6 2	869 15 0	96 19 9	1,260 9 10	...
STIRLING.								
Airth	...	11 18 8	126 0 0	216 15 2	117 5 0	12 9 5	...	...
Balderndock	...	...	36 12 0	81 2 0	53 5 6	...	...	...
Balfron	...	2 11 1	80 8 0	146 19 0	61 10 0	16 11 10	...	14 19 6
Buchanan	...	1 2 0	39 0 0	111 11 9	64 12 6	110 11 4	...	12 2 0
Frenich (Comb.)	...	0 8 11	4 16 0	11 11 0	1 16 0	...	...	...
Campsie	...	55 12 11	395 8 0	825 11 3	168 5 6	221 1 7	...	57 5 0
Denny	...	39 5 9	854 8 0	1,537 13 3	360 3 6	105 8 6	244 8 2	23 0 0
Drymen	...	2 10 8	79 4 0	172 18 3	29 14 0	21 13 1	...	33 3 2
Fintry (Comb.)	...	...	19 16 0	...	7 8 6	...	...	...
Dunipace	...	...	158 8 0	269 1 5	99 8 0	...	98 19 0	...
Falkirk (B.)	...	1,077 9 9	3,194 8 0	6,211 18 2	1,197 18 0	1,319 11 1	4,110 16 8	20 0 0
Falkirk (L.)	...	52 9 6	943 16 0	2,626 18 10	487 12 6	238 18 2	2,456 8 11	23 6 0
Fintry	...	...	34 16 0	80 17 2	54 3 6	10 5 3	...	4 16 9
Gargunnock	5 7 6	17 10 0	45 0 0	82 12 6	18 4 6	4 17 0	...	18 8 6
Grangemouth	694 17 2	112 6 9	1,879 4 0	3,975 2 3	704 14 0	307 7 11	959 7 11	53 15 5
Killearn	...	...	33 12 0	104 12 3	58 18 0	...	...	...
Kilsyth (B.)	...	148 3 8	791 8 0	1,554 4 0	296 15 6	126 15 0	523 18 10	53 4 0
Kilsyth (L.)	...	2 0 0	262 16 0	456 12 9	185 3 6	46 15 8	...	15 4 8
Kippen	27 11 5	18 10 9	160 16 0	310 13 6	140 6 0	25 8 11	...	17 17 0
Larbert	...	38 14 10	1,491 0 0	3,061 6 1	559 2 6	389 6 1	2,398 10 6	27 0 0
Logie	...	21 17 3	222 12 0	434 9 6	83 9 6	33 6 11	...	21 13 11
Muiravonside	...	1 12 6	495 0 0	933 13 4	215 12 6	103 19 11	74 1 1	7 12 5
St Ninians	119 6 9	45 12 11	910 4 0	1,764 19 3	431 15 6	152 9 0	...	33 3 11
Slamannan	99 2 5	0 11 6	480 12 0	858 17 6	180 4 6	56 0 10	281 3 4	42 0 0
Stirling (B.)	...	376 1 0	1,484 8 0	3,128 10 2	596 13 0	510 2 7	...	169 14 2
Strathblane	48 19 7	...	61 4 0	127 7 9	62 19 0	...	...	...
Total of Stirling	995 4 10	2,026 10 5	14,284 16 0	29,085 18 6	6,237 0 6	3,813 0 1	11,127 14 5	648 6 5
SUTHERLAND.								
Assynt	...	...	178 16 0	499 10 6	87 1 0	...	160 18 3	...
Clyne	78 16 4	1 8 10	155 8 0	467 9 6	58 5 6	...	106 4 1	...
Creich	285 6 2	...	139 16 0	407 3 6	142 8 6	...	...	...
Dornoch (including B.)	51 10 1	...	261 0 0	734 2 0	137 17 6	...	44 0 6	...
Durness	128 5 6	...	82 16 0	206 4 11	69 18 6	...	39 19 3	...
Eddrachillis	...	...	113 8 0	292 18 11	152 10 6	...	38 12 10	...
Farr	324 11 10	...	214 16 0	552 1 4	170 11 0	...	61 7 1	...
Golspie	...	...	156 12 0	472 6 6	58 14 6	...	44 17 11	...
Kildonan	12 6 7	...	147 0 0	444 5 2	55 16 0	...	...	...
Lairg	...	...	87 12 0	295 9 0	62 17 0	22 7 1	...	...
Loth	23 2 3	...	29 8 0	87 19 0	11 0 6	...	...	...
Rogart	...	...	67 4 0	193 14 3	115 4 0	..	...	...
Tongue	...	...	147 12 0	342 2 7	175 7 0	...	187 5 5	...
Total of Sutherland	903 18 9	1 8 10	1,781 8 0	4,995 7 2	1,297 11 6	22 7 1	683 5 4	...

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	160 0 0	1/6	...	...	...	41 5 0	939 4 4	32 11 1	1,641
...	180 0 0	1/4	...	...	...	...	837 6 0	...	2,173
...	140 0 0	1/8	...	...	...	2 10 0	987 14 2	...	1,816
...	250 0 0	1/2	...	...	...	1 1 10	1,145 5 1	...	4,959
...	250 0 0	9	...	...	...	0 6 0	596 19 11	32 4 7	4,892
...	135 0 0	2/	...	...	...	5 5 0	890 15 9	...	1,404
...	171 17 11	1/9	...	...	...	1 10 0	1,065 9 5	90 13 7	2,505
250 0 0	2,253 17 11	...	...	210 0 0	...	159 17 1	12,878 6 4	1,496 12 0	42,810
...	520 0 0	1/	...	...	...	...	1,004 8 3	297 3 0	10,223
...	230 0 0	5⅝	...	...	...	...	400 19 6	47 3 10	9,520
...	400 0 0	1/0 4/5	...	...	...	...	722 19 5	64 11 1	7,819
...	340 0 0	9 3/10	...	...	...	...	678 19 7	...	8,995
...	...	...	...	...	29 1 5	...	47 13 4	...	...
...	1,800 0 0	1/4¾	...	2 10 0	...	13 12 0	3,539 6 3	215 0 0	27,609
10 0 0	2,700 0 0	1/5⅞	950 0 0	...	...	7 5 7	6,831 12 9	1,357 11 4	38,299
...	600 0 0	9	...	...	...	0 14 1	939 17 3	...	16,310
...	...	...	...	...	62 17 10	...	90 2 4	104 2 11	...
...	675 0 0	1/7	...	...	...	5 7 0	1,306 3 5	15 1 8	8,950
...	10,500 0 0	2/	3,900 0 0	...	...	*103 10 0	31,635 11 8	1,505 2 8	95,918
...	3,500 0 0	2/1	...	10 17 8	66 17 3	7 0 6	10,414 5 4	...	33,182
...	160 0 0	10	...	40 0 0	...	...	384 18 8	9 8 8	3,905
...	220 0 0	†	...	...	...	...	412 0 0	...	6,848
250 0 0	4,950 0 0	1/4	...	...	...	7 11 7	13,874 7 0	...	81,531
...	300 0 0	3 9/10	...	...	...	...	497 2 3	143 15 2	17,948
...	1,350 0 0	1/4¼	...	.	...	25 0 0	4,869 9 0	20 6 10	19,056
...	800 0 0	7½	1,300 0 0	...	...	12 18 1	3,081 10 8	...	26,913
...	546 1 8	1/	...	...	56 10 10	...	1,303 16 1	...	11,165
...	4,300 0 0	2/4 3/10	...	...	...	0 10 0	12,265 10 0	35 16 5	37,036
...	1,100 0 0	8½	...	..	...	‡54 3 9	1,971 12 10	...	32,972
...	2,000 0 0	1/9⅜	...	...	...	8 7 0	3,839 18 9	499 0 10	23,161
...	2,800 0 0	⅜	5,660 0 0	...	...	6 11 8	11,924 3 5	...	61,954
...	1,200 0 0	1/7¼	...	...	15 16 4	4 0 0	3,218 8 5	...	16,478
...	5,000 0 0	1/0¼	...	222 7 6	...	||136 17 3	11,624 13 8	...	97,756
...	300 0 0	4¼	...	...	...	1 11 6	602 1 10	...	18,154
260 0 0	46,291 1 8	...	11,810 0 0	275 15 2	231 3 8	395 0 0	127,481 11 8	4,314 4 5	711,702
...	500 0 0	1/5	...	...	...	40 0 0	1,466 5 9	...	5,828
80 0 0	520 0 0	1/6⅔	...	...	...	1 14 2	1,469 6 5	28 6 6	6,716
...	635 0 0	1/3	...	...	...	...	1,609 14 2	...	10,431
80 0 0	380 0 0	8	...	...	...	...	1,688 10 1	...	10,624
...	400 0 0	2/6½	...	...	...	¶60 0 0	987 4 2	...	3,685
...	600 0 0	2/	220 0 0	...	...	34 0 0	1,451 10 3	1 15 4	6,613
...	850 0 0	1/6	...	...	...	**220 0 0	2,393 7 3	...	11,134
70 0 0	300 0 0	10¼	...	...	...	63 9 0	1,165 19 11	175 3 6	6,942
80 0 0	600 0 0	1/	...	...	...	1 14 7	1,341 2 4	...	12,131
80 0 0	300 0 0	1/1	...	...	...	2 3 6	850 8 7	...	6,490
...	75 0 0	6¼	...	...	...	...	226 9 9	...	2,476
...	300 0 0	1/2	...	...	...	1 1 8	677 3 11	40 11 6	5,064
...	500 0 0	2/4	...	...	...	...	1,352 7 0	...	4,406
390 0 0	5,960 0 0	...	220 0 0	...	...	424 2 11	16,679 9 7	245 16 10	92,540

* From Gaff Trust, £50. † Owners, 3½d.; Occupiers, 1⅝d., 5¼d. ‡ Rents, £45. § Owners, 5 7/10d.; Occupiers, 1⅝d., 6 7/10d.
|| Rents, £108 8s. 8d. ¶ From Campbell Bequest.
** From Congested Districts Board towards erection of Strathnaver School, £195.

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c., for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended, and under Minute of 19th July 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
WIGTOWN.								
Glasserton	134 2 11	...	60 12 0	110 3 0	121 3 0	45 15 10	...	12 4 11
Inch	44 1 0	...	180 12 0	347 3 3	107 14 6	...	...	...
Kirkcolm	...	...	111 0 0	211 15 0	131 12 6	...	...	...
Kirkcowan	...	...	114 12 0	222 18 9	42 19 6	...	...	8 5 6
Kirkinner	...	...	116 8 0	323 5 6	43 13 0	18 11 0	...	5 11 1
Kirkmaiden	83 11 2	...	162 12 0	332 5 6	150 19 6	...	...	...
Leswalt	62 15 1	...	74 8 0	146 14 0	27 18 0	...	...	...
Mochrum	...	...	124 8 0	147 0 3	149 19 6	29 7 4	...	...
New Luce	...	...	67 4 0	136 6 0	65 4 0	...	...	...
Old Luce	...	...	207 12 0	409 6 11	77 17 0	11 12 6	...	11 5 1
Penninghame	...	...	255 12 0	494 13 10	182 18 6	27 7 11	...	...
Portpatrick	3 11 6	...	85 4 0	156 2 3	31 19 0	...	...	...
Sheuchan	12 1 8	...	*...	...	...	...	...	...
Sorbie	...	...	151 16 0	291 16 6	56 14 0	...	...	...
Stoneykirk	...	...	213 0 0	388 11 6	119 17 6	...	...	...
Stranraer (B.)	...	13 10 0	531 12 0	1,063 0 9	199 7 0	62 10 6	116 16 1	...
Whithorn	...	...	140 16 0	259 9 3	79 4 0	18 13 10	...	6 18 4
Wigtown	58 17 6	5 5 9	130 4 0	272 8 9	48 16 6	...	...	...
Total of Wigtown	399 0 10	18 15 9	2,727 12 0	5,313 1 0	1,637 17 0	213 18 11	116 16 1	44 4 11
Total of Scotland	132,839 13 0	47,834 12 5	368,133 15 0	825,954 10 5	173,631 5 2	73,816 13 11	81,334 3 9	8,055 18 6
Less Balances in hand on 15th May 1906								
Net Income								

* No School under the Board.

School Boards for the Year ended the 15th May 1907.—INCOME—*continued.*

Grants from Committee for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable Value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
...	350 0 0	9	...	...	...	11 15 0	845 16 8	6 14 7	10,335
...	475 0 0	8¾	...	...	...	4 14 8	1,159 5 5	...	15,290
...	320 0 0	8½	...	...	...	...	774 7 6	...	9,285
...	321 0 0	9½	...	...	...	...	709 15 9	30 8 7	8,387
...	549 11 2	11¾	...	...	...	0 15 0	1,057 14 9	...	12,401
25 0 0	850 0 0	1/8	...	...	...	0 3 4	1,604 11 6	...	11,138
...	303 0 0	1/1	400 0 0	...	...	...	1,014 15 1	...	7,217
25 0 0	1,169 9 4	1/3	...	...	...	2 10 0	1,647 14 5	196 4 6	12,712
...	170 0 0	6½	...	1 4 0	...	7 0 0	446 18 0	...	6,887
...	660 0 0	9½	...	...	...	0 15 6	1,378 9 0	149 16 4	17,291
...	750 0 0	10	...	...	...	...	1,710 12 3	170 5 7	19,752
...	220 18 4	8	...	...	...	...	497 15 1	...	6,809
...	87 8 2	10	...	...	...	...	99 9 10	...	2,177
...	400 0 0	10½	...	...	...	...	900 6 6	96 4 3	11,904
...	750 0 0	1/0¾	...	...	...	...	1,471 9 0	70 2 2	15,557
...	1,010 5 10	10	...	...	80 0 0	*86 8 6	3,163 10 8	172 0 7	24,707
...	530 0 0	10½	...	...	...	...	1,035 1 5	265 1 7	15,179
50 0 0	450 0 0	11	...	...	...	...	1,015 12 6	...	9,749
100 0 0	9,366 12 10	...	400 0 0	1 4 0	80 0 0	114 2 0	20,533 5 4	1,156 18 2	216,777
27,272 14 6	1,313,583 15 8	...	396,306 11 7	9,573 14 1	9,561 0 5	56,176 2 11	3,524,074 11 4	119,995 7 3	25,513 442
							132,839 13 0		
							3,391,234 18 4		

* Rents. £49.

SCHOOL BOARDS' . . . . . .

GENERAL ABSTRACT of STATEMENTS of INCOME, EXPENDITURE, and

(Published under Section 51 of the

EXPENDITURE.

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
ABERDEEN.									
Aberdeen (B.)	9,473 18 1	576 0 8	2,426 4 6	66,801 17 2	17,689 17 10	428 13 0	4,583 4 6	4,414 11 10	2,426 4 7
Aberdour	..	...	25 0 0	560 7 11	...	3 3 2	18 13 3	13 8 5	36 18 6
Aboyne and Glentanar	362 8 1	...	15 0 0	675 3 7	...	1 17 6	10 17 4	25 10 1	4 4 1
Alford	...	...	15 0 0	728 17 1	...	2 15 6	8 16 5	21 12 8	72 12 6
Ardallie	...	...	15 10 0	403 11 5	...	5 12 6	4 18 3	12 18 8	10 19 9
Auchindoir and Kearn	68 3 2	...	12 12 0	460 19 9	...	3 10 6	16 8 2	20 11 5	10 18 6
Auchterless	...	...	40 0 0	525 8 3	153 0 0	2 5 9	8 17 5	10 17 8	4 6 2
Belhelvie	...	...	28 0 0	711 19 10	...	6 5 4	15 4 11	14 2 9	69 1 7
Birse	...	...	12 10 0	452 10 5	...	4 15 10	8 16 8	10 1 4	17 10 4
Bourtie	...	...	7 0 0	90 0 0	...	0 2 3	1 17 9	2 11 0	1 11 11
Cairney	131 10 8	...	27 10 0	835 7 9	131 11 2	2 3 10	23 11 3	29 5 10	35 0 3
Chapel of Garioch	...	...	18 10 0	831 6 3	5 17 6	7 2 7	18 17 0	19 0 7	25 0 10
Clatt	69 10 11	...	5 15 0	192 9 6	...	1 6 8	3 2 1	4 9 6	2 3 11
Cluny	...	8 7 0	15 0 0	250 12 3	54 0 1	2 10 11	3 4 5	1 18 6	24 6 6
Coull	...	...	7 10 0	179 3 6	17 11 6	1 16 4	1 13 11	3 4 1	11 5 5
Crathie and Braemar	...	..	28 0 0	495 4 8	...	7 15 6	5 3 10	28 17 0	129 18 7
Crimond	...	...	14 0 0	431 9 1	...	2 10 0	11 14 0	13 6 6	53 7 6
Cruden	44 14 10	...	57 10 0	1,291 15 4	...	9 19 4	73 2 7	81 12 10	87 3 9
Culsalmond	45 11 9	...	8 17 0	220 8 2	...	2 3 0	1 9 2	9 8 7	29 10 8
Daviot	97 7 0	...	10 2 0	326 10 1	108 4 0	5 16 3	2 3 11	15 6 7	0 18 11
Drumblade	21 2 2	...	15 2 0	324 1 10	...	4 16 6	13 16 9	6 4 1	20 0 0
Drumoak	...	...	23 0 0	425 16 11	...	6 18 10	7 19 10	5 17 5	21 17 0
Dyce	128 4 4	...	17 0 0	554 4 2	...	3 4 11	2 11 11	24 6 5	51 6 1
Echt	37 4 3	8 14 10	18 2 0	497 3 4	...	2 8 5	6 4 11	29 3 8	17 14 4
Ellon	23 5 4	...	60 0 0	1,828 17 6	24 1 5	20 4 0	55 18 9	74 6 11	63 11 5
Fintray	...	...	13 0 0	398 14 11	...	1 9 6	11 16 9	10 4 6	51 17 1
Forgue	...	14 11 8	24 0 0	595 11 2	...	1 16 11	6 10 0	12 4 6	12 17 6
Foveran	579 10 9	...	20 0 0	953 13 3	...	3 5 0	10 12 11	37 7 5	66 11 8
Fraserburgh	...	...	108 5 0	3,459 18 6	1,097 9 6	25 17 5	136 10 9	295 14 5	91 17 11
Fyvie	90 19 5	...	35 0 0	1,192 19 8	52 14 6	10 18 7	23 2 1	49 7 7	153 17 1
Gartly	155 2 6	...	14 0 0	377 9 8	...	2 8 0	4 19 4	15 16 2	13 0 3
Glass	...	...	15 0 0	373 7 6	...	2 19 4	8 4 3	12 8 1	67 0 11
Glenbucket	11 5 7	...	12 2 3	309 6 5	...	2 3 1	3 16 7	5 6 6	6 14 9
Glengairn	...	...	10 0 0	58 0 0	...	0 9 3	5 19 10	3 6 1	0 10 9
Glenmuick and Tullich	...	...	41 10 0	827 15 10	242 6 0	7 8 9	18 2 7	27 4 5	29 16 5
Huntly	111 17 7	...	143 3 0	2,464 7 7	...	20 15 11	91 14 10	135 14 3	146 13 8
Insch	...	...	30 0 0	797 10 5	...	7 2 4	38 5 4	30 7 0	38 16 1
Inverurie	...	...	97 10 0	2,065 6 11	...	14 2 2	75 4 4	129 1 3	55 1 3
Keig	171 16 9	...	7 0 0	352 8 5	...	1 9 4	11 10 1	9 5 10	17 0 3
Keithhall and Kinkell	...	...	10 0 0	278 6 2	...	1 14 10	8 0 7	5 2 4	55 0 10

. . . . . ACCOUNTS.

Liabilities of School Boards for the Year ended the 15th May 1907.

Education (Scotland) Act, 1872.)

EXPENDITURE.

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
9,096 5 1	...	12,738 19 8	12,255 7 9	33 6 0	2,210 7 10	2,196 18 6	147,351 17 0	...	386,526 12 6
39 7 0	16 10 7	28 17 9	73 7 8	...	...	10 11 5	826 5 8	...	777 12 6
41 19 9	...	48 7 0	77 4 4	...	...	8 3 11	1,270 15 8	...	1,657 12 11
28 18 2	...	7 7 10	17 6 4	15 4 2	...	...	918 10 8	301 4 11	194 8 9
10 1 5	20 0 0	30 8 9	29 4 9	...	...	5 12 0	548 17 6	102 5 3	840 7 2
25 2 7	4 10 0	35 13 11	71 17 8	...	...	2 15 2	733 2 10	35 7 5	954 12 4
37 12 0	...	...	...	...	...	1 4 10	783 12 1	139 15 9	...
53 1 10	...	60 11 4	104 15 3	...	...	1 6 10	1,064 9 8	170 19 6	1,698 7 1
29 12 5	...	26 2 3	39 11 8	...	...	6 9 0	607 19 11	123 18 4	758 10 10
5 8 6	...	3 3 11	19 15 5	...	...	0 17 3	132 8 9	...	70 6 8
33 8 0	...	78 3 1	116 0 11	...	...	25 10 1	1,469 2 10	...	1,946 2 10
56 1 7	...	86 1 0	149 15 10	...	...	6 16 0	1,224 9 2	...	2,395 14 0
9 18 1	...	4 8 2	9 10 0	...	...	0 11 2	303 5 0	...	163 17 8
5 6 0	15 9 6	...	...	...	...	...	380 15 2	83 1 7	...
11 17 5	...	0 16 6	5 0 0	...	...	3 8 7	243 7 3	22 9 10	20 0 0
46 11 1	...	66 6 9	28 17 8	...	...	5 0 0	841 15 1	...	1,863 18 6
24 3 0	...	18 19 0	30 3 4	...	...	21 1 0	620 13 5	...	563 12 9
67 16 8	...	139 11 1	192 10 0	...	...	0 7 10	2,046 4 3	151 7 9	3,807 13 1
10 7 9	2 6 5	1 1 8	30 19 9	...	...	2 19 11	365 3 10	48 19 7	...
10 18 0	...	3 17 5	21 2 7	...	...	1 1 6	603 8 3	416 1 10	589 9 5
18 7 8	6 19 4	32 16 4	52 9 3	...	...	0 17 10	516 13 9	23 2 6	927 2 4
24 18 0	...	3 8 2	9 10 0	...	...	...	529 6 2	136 16 5	90 5 0
41 9 9	36 14 6	43 8 8	84 7 4	...	...	16 13 1	1,003 11 2	...	1,327 3 9
52 18 6	...	14 1 9	60 0 0	...	...	2 6 9	746 2 9	...	341 6 11
121 9 8	...	132 6 6	142 8 1	...	...	21 8 2	2,567 17 9	425 10 9	3,757 13 2
14 14 4	...	12 9 1	68 10 11	...	...	1 6 2	584 2 6	65 5 11	287 6 5
44 2 11	...	13 5 10	25 5 7	...	...	...	750 6 1	13 6 0	400 16 8
43 6 3	...	41 5 5	54 0 8	...	...	39 0 8	1,848 14 0	...	1,773 13 11
218 18 10	...	256 19 2	354 0 0	...	...	12 8 7	6,058 0 1	...	7,178 8 6
65 1 1	...	57 13 5	146 15 9	...	...	3 0 6	1,881 9 8	...	1,749 3 11
16 3 0	2 6 5	18 7 3	37 6 5	...	...	16 13 7	673 12 7	18 18 10	528 8 3
29 2 11	...	24 13 6	30 9 2	...	...	11 14 4	574 17 0	...	692 4 11
11 18 8	...	...	...	...	...	0 4 6	362 18 4	...	29 12 7
5 0 5	7 4 0	15 0 3	14 2 10	...	...	...	119 13 5	28 14 10	379 9 10
51 4 10	...	81 18 7	23 8 8	...	...	17 15 6	1,438 11 7	132 4 0	2,473 7 10
150 16 1	...	299 11 0	450 0 0	...	...	24 2 8	4,038 16 7	48 2 10	9,225 0 0
48 11 2	...	82 12 4	111 14 5	...	...	18 9 0	1,203 8 1	93 17 10	2,751 7 5
104 9 11	...	336 8 2	124 1 0	...	...	21 15 9	3,023 0 9	155 18 9	9,957 9 7
17 14 0	...	23 4 5	43 6 8	...	...	3 8 8	658 4 5	...	739 8 1
12 15 11	...	11 2 2	31 0 10	...	...	...	413 3 8	28 14 1	286 7 8

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
ABERDEEN—*contd.*									
Kemnay	...	...	22 0 0	978 19 3	2,427 15 4	4 15 7	16 18 6	48 6 1	44 16 2
Kennethmont	31 0 4	...	16 15 0	389 2 4	...	5 18 2	13 6 10	14 15 0	72 15 11
Kildrummy	19 4 9	...	10 0 0	276 12 8	...	0 19 5	4 18 9	4 7 8	21 8 0
Kincardine O'Neil	87 13 4	...	27 0 0	1,025 15 10	...	4 15 2	32 11 2	68 3 5	31 11 10
King Edward	...	...	12 10 0	616 10 2	22 5 3	3 16 3	4 4 7	15 8 1	18 5 7
Kininmonth	...	2 18 4	17 0 0	428 3 11	42 10 11	4 7 10	6 1 7	19 17 2	20 0 5
Kinnellar	...	...	11 0 0	215 0 0	...	0 13 10	7 11 0	3 5 2	22 0 1
Kintore (incl. B.)	...	...	25 0 0	1,099 8 9	160 5 8	6 13 4	8 10 2	44 15 3	62 6 3
Leochel-Cushnie	...	...	18 0 0	531 8 3	104 18 3	7 15 9	3 18 8	19 12 11	8 14 9
Cairncoullie (Comb.)	66 0 0	...	4 4 0	160 3 4	...	6 5 10	2 1 8	4 14 7	32 0 9
Craigievar (Comb.)	151 10 5	...	5 0 0	218 0 0	...	0 15 6	2 9 7	9 8 2	5 1 3
Leslie	50 14 3	...	8 10 0	270 17 6	...	0 17 3	2 16 0	3 5 0	35 18 9
Logie-Buchan	...	...	14 0 0	375 6 1	1 15 0	7 19 2	13 16 6	9 19 9	172 0 1
Logie-Coldstone	...	...	12 0 0	371 5 7	4 17 8	4 10 11	4 14 7	13 8 4	23 17 9
Longside	...	...	37 10 0	1,149 15 9	...	10 9 10	25 4 7	46 14 0	121 11 5
Lonmay	204 8 11	...	26 0 0	1,092 7 4	...	10 2 6	31 6 4	40 10 11	69 12 2
Lumphanan	33 2 1	6 6 0	19 0 0	285 3 1	...	1 12 5	6 1 6	5 15 5	23 17 3
Meldrum	...	...	32 0 0	737 2 3	...	4 11 8	5 17 1	27 4 11	39 10 4
Methlick	41 8 2	...	17 10 0	737 2 7	...	3 19 1	30 6 1	18 13 9	25 14 0
Midmar	...	...	10 0 0	317 0 9	...	0 18 6	1 0 10	11 3 3	125 0 8
Millbrex	2 15 7	...	13 0 0	180 0 0	...	2 2 7	3 14 3	10 17 10	9 12 5
Monquhitter	...	...	27 10 0	727 15 4	174 4 1	7 18 3	15 17 4	29 18 5	79 12 11
Monymusk	...	...	12 0 0	578 2 11	...	2 14 10	7 16 5	56 8 5	3 13 3
New Byth	56 13 11	...	22 0 0	733 19 10	...	4 6 11	28 19 0	17 14 11	81 15 6
New Deer	58 13 3	...	1,599 9 0	754 9 6	25 19 4	50 17 4	49 19 9	130 5 3	
Newhills	296 3 7	...	71 10 6	2,159 12 0	...	34 14 7	123 1 2	106 9 3	137 1 2
New Machar	...	...	33 3 0	649 17 3	...	7 4 2	11 9 10	18 4 3	85 2 9
New Pitsligo	...	...	22 5 0	560 12 5	...	6 12 1	22 3 2	17 6 11	60 13 10
Old Deer	31 19 6	...	44 0 0	1,480 13 8	...	13 12 4	45 1 5	48 11 11	82 18 8
Maud (Comb.)	...	...	30 14 6	512 12 2	...	5 8 7	12 12 8	21 18 7	130 12 3
Old Machar	...	...	28 0 0	505 5 3	...	10 6 1	32 6 9	18 14 10	88 9 1
Oyne	...	...	13 12 0	358 5 11	...	5 14 7	3 6 8	8 8 10	4 15 5
Peterculter	...	...	79 10 0	1,883 14 10	303 10 0	29 12 4	90 14 6	147 7 4	132 2 11
Peterhead (B.)	70 11 6	14 16 3	233 2 6	5,957 12 4	893 12 2	109 1 10	392 7 11	183 7 7	263 10 2
Peterhead (L.)	...	28 0 0	65 6 8	1,260 12 3	654 15 5	28 7 0	47 15 6	79 15 10	79 13 6
Pitsligo	73 0 0	5 17 10	36 0 0	1,112 2 5	...	11 6 5	32 2 11	40 10 6	69 5 6
Premnay	...	...	8 15 0	352 9 4	...	2 15 3	6 10 0	10 13 6	17 3 9
Rathen	39 12 7	...	31 0 0	1,099 12 2	21 9 0	4 8 2	32 0 10	41 1 1	74 12 10
Rayne	...	...	14 0 0	486 11 0	69 8 10	5 7 3	6 2 8	22 7 6	49 6 11
Rhynie	92 2 9	...	24 10 0	616 10 4	...	2 14 7	42 13 2	17 6 11	43 1 11
St Fergus	149 5 4	...	25 0 0	455 17 0	...	7 2 8	14 11 9	19 9 2	46 4 1
Savoch	...	...	15 0 0	578 4 10	44 18 0	9 10 10	12 14 9	18 9 0	69 8 2
Skene	...	...	35 0 0	702 11 0	...	5 16 11	22 5 7	14 3 1	110 1 11
Slains	...	...	24 12 0	351 9 6	...	5 7 9	23 11 2	13 3 2	44 17 8
Strathdon	...	...	30 0 0	533 5 6	128 15 0	2 16 4	6 17 11	20 4 8	11 18 0
Strichen	...	...	16 10 0	876 19 8	...	4 2 9	15 8 10	20 15 6	74 2 8
Tarland	7 9 8	...	10 0 0	296 10 4	...	1 19 10	3 18 9	11 11 6	9 4 0
Tarves	...	...	28 0 0	898 6 6	6 0 0	7 2 3	29 3 8	33 1 4	35 11 7
Tough	184 3 9	...	8 0 0	296 11 2	...	1 18 7	1 16 0	10 4 8	45 5 1
Towie	16 5 10	...	12 0 0	420 10 1	505 0 0	16 10 2	14 15 2	20 7 1	2 2 7
Tullynessle and Tulliallan	...	...	8 0 0	423 11 9	...	2 16 9	5 4 4	3 18 4	11 2 2
Turriff	90 4 8	...	94 14 4	2,273 9 8	272 9 2	23 16 10	53 3 5	44 16 11	148 12 3
Tyrie	...	...	21 7 0	265 10 0	...	2 3 8	3 2 5	7 11 9	14 3 8
Udny	...	...	21 2 6	572 10 9	7 1 0	5 17 10	4 15 2	16 5 8	60 5 4
Ythan Wells	6 9 0	...	20 0 0	428 8 4	...	1 10 6	1 2 3	13 3 8	22 8 8
Total of Aberdeen	13,425 13 1	665 12 7	5,086 2 0	138,064 14 1	26,176 13 9	1,154 17 3	6,806 19 2	7,320 3 11	7,339 10 9

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
50 12 7	...	87 7 3	77 11 11	6 16 0	...	1 16 1	3,767 14 9	...	4,107 7 7
25 15 7	...	7 3 7	81 8 9	...	...	4 3 2	662 4 8	36 7 9	151 0 0
12 7 0	...	4 19 8	13 5 0	...	...	0 8 5	368 11 4	...	142 8 1
61 5 2	...	120 3 10	193 18 5	...	...	1 10 9	1,654 8 11	7 3 11	3,209 12 6
32 0 0	...	15 17 5	25 12 0	...	...	11 4 7	777 13 11	84 2 0	412 5 0
20 16 8	...	34 15 7	47 14 7	...	...	0 1 4	644 8 4	11 6 3	936 13 5
16 11 11	...	3 19 7	7 0 0	...	...	...	281 1 7	5 12 10	108 10 0
45 12 0	...	45 9 10	106 6 7	2 18 2	...	4 12 3	1,611 18 3	190 6 9	1,408 19 3
18 6 2	110 19 0	48 5 2	98 9 11	...	...	2 16 7	973 5 5	152 7 6	1,280 14 1
7 19 6	..	...	...	...	...	0 13 10	284 3 6	...	65 15 0
				...					
10 11 0	...	...	...	...	...	2 12 5	405 8 4	...	114 3 2
8 4 0	...	...	...		...	3 18 9	385 1 6	...	78 5 7
20 8 1	...	34 12 11	34 1 0	...	...	0 2 9	684 1 4	...	996 13 9
19 19 7	...	12 2 4	12 8 9	1 3 6	...	2 10 0	482 19 0	64 18 2	333 15 8
59 4 6	...	24 15 4	88 6 8	3 12 6	...	1 13 11	1,573 18 6	403 16 11	660 6 8
68 14 0	...	103 18 3	115 8 6	...	...	6 16 9	1,769 5 8	...	2,991 9 3
13 16 5	32 4 4	27 17 5	51 16 0	...	...	0 13 5	507 5 4	...	735 14 3
42 1 0	...	84 12 10	85 17 2	...	...	...	1,058 17 3	12 14 1	2,332 10 4
47 16 6	...	35 18 1	52 19 9	...	...	17 3 4	1,028 11 4	32 8 11	989 14 4
18 2 4	...	6 7 6	40 0 0	...	...	0 4 6	529 18 4	22 1 4	140 0 0
10 3 8	10 0 0	16 16 6	17 5 6	...	...	0 1 3	276 9 7	34 16 8	463 8 9
42 3 0	10 14 1	62 19 2	90 0 0	...	...	0 9 2	1,269 1 9	107 0 4	1,731 3 10
25 14 5	...	3 10 6	24 9 6	...	...	10 18 10	725 9 1	23 11 0	76 3 11
40 10 10	...	35 14 2	36 15 1	...	...	2 14 2	1,061 4 4	...	1,040 0 2
93 11 4	160 5 2	203 18 5	273 18 8	...	...	4 0 0	3,405 7 0	29 2 2	5,520 3 4
223 7 4	...	227 15 6	279 16 1	...	...	29 14 7	3,689 5 9	...	6,654 17 7
43 15 2	...	42 6 2	90 19 11	...	...	...	982 2 6	24 14 8	1,123 14 4
36 15 7	...	60 14 6	67 0 8	...	...	13 11 4	867 15 6	76 6 7	1,697 3 1
85 12 11	160 5 3	75 11 0	151 15 5	...	...	8 3 8	2,228 5 9	...	2,187 14 2
27 2 2	...	...	...	...	...	13 19 6	755 0 5	...	...
48 2 11	...	20 18 10	65 1 2	..	...	5 7 2	822 12 1	289 15 3	549 7 10
14 13 4	7 4 0	8 15 1	13 6 8	...	...	6 7 0	444 9 6	51 11 1	260 0 0
161 14 0	...	249 6 5	242 2 7	...	...	120 16 0	3,440 10 11	178 17 7	8,681 16 6
583 11 2	...	576 8 11	405 7 9	5 3 6	...	93 10 8	9,782 4 3	...	17,078 3 8
96 14 5	...	152 0 5	203 11 7	...	...	6 0 0	2,702 12 7	24 8 5	4,329 3 6
57 11 6	...	79 18 3	99 6 3	...	...	4 19 2	1,622 0 9	...	2,196 0 10
13 5 8	20 0 0	8 0 11	49 13 8	...	...	1 2 4	490 9 5	57 1 6	179 16 2
74 4 4	...	79 17 6	81 14 11	1 10 0	...	6 17 0	1,588 0 5	...	2,388 17 3
24 5 3	...	20 9 3	80 1 4	...	...	3 10 0	781 10 0	49 12 8	484 10 11
43 11 11	...	25 9 6	46 15 10	3 3 0	...	15 1 0	973 0 11	...	824 17 3
22 9 6	...	52 8 9	56 13 3	...	...	7 1 4	856 2 5	...	1,599 0 7
41 6 6	15 0 0	35 19 1	48 13 4	...	...	1 3 3	890 7 9	...	1,025 10 6
83 13 6	...	5 14 0	50 0 0	...	...	...	1,029 6 0	211 6 3	121 0 0
26 9 2	6 0 0	21 18 6	31 8 3	...	...	0 18 5	549 15 7	62 4 2	595 1 3
34 0 9	15 18 5	63 15 6	92 0 11	...	...	24 1 5	963 14 5	16 12 1	1,751 12 3
51 12 11	...	46 13 9	55 14 0	...	...	3 8 9	1,165 8 10	78 19 5	1,238 10 0
20 6 9	...	27 1 8	43 0 0	...	...	0 11 7	431 14 1	75 10 6	741 10 0
44 10 9	...	66 14 11	108 7 9	0 7 6	...	5 3 9	1,262 10 0	161 6 10	1,418 7 11
11 17 9	44 19 4	24 4 7	36 18 7	...	...	4 8 8	670 8 2	...	817 19 9
21 11 6	32 19 3	14 8 0	29 7 1	2 12 6	...	6 13 9	1,115 3 0	294 3 0	1,183 8 9
19 0 6	...	32 5 1	40 17 0	30 0 0	...	13 2 0	594 17 11	116 5 6	837 11 0
116 0 9	...	75 11 10	181 13 4	...	...	22 13 0	3,397 6 2	...	2,499 9 3
11 14 4	...	3 1 4	11 18 8	...	...	51 16 2	342 9 0	35 7 10	75 13 9
31 17 1	62 8 2	11 11 4	18 0 0	...	...	1 1 0	812 15 10	73 11 5	317 0 0
23 1 10	4 12 10	20 3 11	50 1 1	...	...	0 0 5	591 2 6	...	533 11 1
13,637 8 9	805 10 7	18,029 18 11	19,511 9 4	110 16 10	2,210 7 10	3,014 6 11	263,360 5 9	5,861 15 10	543,134 1 4

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s. d.	£ s. d.
ARGYLL.									
MAINLAND.									
Acharacle	63 11 8	4 11 6	26 0 0	380 9 7	...	10 3 11	17 19 2	32 10 7	119 10 0
Ardchattan and Muckairn	...	5 14 0	43 1 8	643 15 6	41 15 8	4 12 0	14 1 10	36 6 6	39 8 1
Achaleven (Comb.)	76 1 8	...	3 3 0	207 13 10	...	0 8 1	8 3 10	10 2 11	18 2 8
Taynuilt (Comb.)	110 13 8	...	6 6 0	222 10 0	...	0 3 6	0 8 6	10 2 3	1 1 1
Ardgour	...	20 4 11	25 0 0	292 18 6	...	3 5 9	25 10 6	34 10 8	32 2 0
Ardnamurchan	6 5 2	5 12 6	24 0 0	240 3 8	...	11 3 6	20 17 1	42 15 3	40 12 6
Campbeltown (B.)	1,499 3 6	...	110 0 0	5,232 11 7	2,191 16 5	12 5 0	293 3 7	193 4 11	193 19 6
Campbeltown (L.)	346 19 2	...	49 2 0	873 10 6	...	4 5 8	52 18 2	43 1 11	77 2 4
Craignish	9 9 9	2 19 1	8 2 0	138 10 0	...	1 6 3	2 13 0	3 2 9	0 13 6
Cumlodden	33 1 4	5 17 5	21 0 0	200 0 0	...	4 12 11	1 11 3	10 1 8	3 11 9
Dunoon and Kilmun	...	...	216 9 6	4,478 2 0	5,776 1 6	99 14 4	438 3 7	208 18 6	200 16 9
Glassary	55 8 6	4 4 4	43 13 10	636 16 0	153 5 9	2 18 0	19 12 2	52 9 5	23 13 7
Glenaray and Inveraray	...	...	38 17 6	558 17 4	2,056 13 10	20 12 6	20 8 0	19 2 4	215 5 11
Glenorchy and Inishail	...	16 4 0	39 0 0	474 16 2	25 19 7	4 10 0	7 0 4	10 15 0	5 13 0
Inverchaolain	11 11 0	3 17 1	12 0 0	227 15 0	...	2 17 3	8 2 0	20 13 10	28 5 1
Kilbrandon and Kilchattan	...	10 9 1	45 0 0	582 17 2	51 1 6	24 3 7	99 16 5	35 0 5	141 7 6
Kilcalmonell	53 18 6	2 12 3	13 0 0	319 18 11	...	12 19 0	2 3 4	10 5 11	40 16 3
Kilchrenan and Dalavich	25 0 10	10 12 3	30 0 0	338 3 9	...	3 19 0	7 0 4	22 6 11	41 17 4
Kilfinan	300 5 3	...	42 0 0	881 1 11	4 5 0	8 6 4	29 9 5	28 1 7	47 19 11
Killean and Kilchenzie	165 9 0	...	28 0 0	528 10 0	...	2 10 5	11 11 3	32 4 5	37 6 7
Kilmartin	...	...	12 0 0	327 15 9	...	3 12 3	14 3 7	12 8 10	63 14 1
Kilmodan	166 1 8	...	18 0 0	199 16 8	...	2 6 7	2 16 7	10 18 6	4 11 5
Kilmore and Kilbride	17 11 4	3 12 11	24 0 0	253 0 0	...	0 18 8	6 0 7	19 2 3	13 3 5
Kilninver and Kilmelford	...	2 10 0	11 0 0	252 17 8	...	2 14 8	5 15 4	8 18 9	2 6 7
Lismore & Appin	...	28 19 6	70 0 0	1,274 13 9	...	11 8 9	34 2 6	57 0 11	75 2 6
Lochgilphead	...	25 10 4	47 0 0	1,337 3 11	475 5 2	13 10 4	49 19 0	66 5 3	111 5 3
Lochgoilhead and Kilmorich	47 2 11	5 13 9	30 0 0	374 5 0	...	7 19 3	15 11 4	28 6 7	17 14 7
Morvern	25 1 6	...	17 0 0	376 13 3	...	4 16 5	11 7 2	26 4 7	21 8 5
North Knapdale	18 9 6	...	32 0 0	488 16 9	...	11 6 11	19 5 4	24 17 7	7 9 6
Oban (B.)	741 6 7	...	162 3 0	3,024 18 1	...	28 14 2	177 3 4	204 17 8	63 19 0
Saddell and Skipness	...	6 19 7	37 0 0	535 17 8	...	7 4 7	13 3 9	29 13 4	38 19 11
Southend	193 12 6	...	17 11 0	389 10 0	...	2 16 10	7 4 8	17 17 6	18 4 7
South Knapdale	...	6 9 2	29 5 0	437 19 11	...	5 13 8	14 7 8	37 3 3	71 3 9
Stralachlan and Strachur	7 1 6	8 2 0	38 11 8	359 16 8	...	5 18 8	14 4 1	22 9 6	69 9 0
Strontian	...	12 14 4	27 10 0	257 19 5	...	7 0 4	24 7 5	9 9 0	38 19 5
Tarbert	1,147 12 6	10 15 4	30 0 0	1,040 19 6	...	16 9 9	48 18 9	31 17 6	28 2 2
INSULAR.									
Coll	53 8 7	1 17 6	5 0 0	288 5 0	...	5 5 8	25 17 8	32 11 9	3 4 6
Colonsay and Oronsay	...	2 0 0	7 0 0	143 10 0	...	0 14 0	0 6 3	1 6 7	0 17 5
Gigha and Cara	...	...	7 10 0	188 16 0	...	5 11 6	1 9 4	13 7 0	2 1 0
Jura	28 1 7	...	55 0 0	555 11 5	...	7 16 2	12 17 11	23 1 10	17 0 2
Kilarrow and Kilmeny	100 8 8	...	52 5 0	1,297 4 11	...	13 14 2	90 14 6	37 17 0	58 9 2
Kilchoman	82 17 11	...	50 10 0	1,023 1 9	...	31 19 3	65 11 7	43 15 2	53 8 6
Kildalton	36 1 8	4 1 3	45 0 0	929 14 3	...	13 17 9	8 8 7	51 14 5	37 15 7
Kilfinichen and Kilvickeon	...	15 4 6	30 0 0	746 14 9	...	19 2 10	26 13 0	35 15 0	79 16 5
Kiliuinian and Kilmore	...	...	49 0 0	1,035 15 1	...	19 10 2	79 2 11	62 10 10	97 9 9
Salen	...	10 13 7	16 0 0	227 10 0	...	3 12 1	18 10 8	18 3 0	6 15 9
Torosay	90 19 0	...	22 2 3	350 16 6	0 15 0	11 3 4	21 4 3	28 18 10	37 18 3
Tyree	313 1 10	...	37 0 0	973 16 4	...	10 17 4	3 2 8	53 7 6	101 19 10
Total of Argyll	5,825 18 3	238 2 2	1,803 3 5	36,152 1 5	10,776 19 5	510 13 1	1,943 4 2	1,845 17 8	2,451 15 3

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
20 0 4	...	4 3 9	5 4 0	...	...	11 13 5	695 17 11	...	243 3 0
28 8 1	210 15 0	26 19 1	73 4 10	...	...	1 17 10	1,170 0 1	32 12 2	711 11 11
10 17 5	...	...	...	...	...	1 17 1	336 10 6	...	...
12 7 6	...	...	...	...	...	2 9 3	366 1 9	...	131 10 7
20 17 10	...	4 0 4	15 3 8	...	...	4 15 7	478 9 9	...	154 9 11
19 8 3	...	3 9 5	11 0 0	...	...	1 18 9	427 6 1	...	111 6 1
398 13 1	...	508 9 9	831 5 4	0 8 6	...	55 9 4	11,520 10 6	...	17,378 2 8
44 11 6	19 0 0	51 17 2	77 6 2	...	...	41 1 0	1,680 15 7	...	1,755 6 6
3 15 6	...	...	...	...	...	8 2 9	178 14 7	...	15 8 7
10 11 3	...	14 12 6	13 6 8	...	...	7 12 4	325 19 1	60 4 7	380 0 0
293 4 1	...	791 13 4	1,115 13 9	1 0 6	...	182 15 1	13,802 12 11	594 18 5	24,042 4 1
58 1 1	...	38 10 8	103 4 6	...	...	39 6 8	1,211 4 6	...	1,137 13 8
32 6 7	...	28 16 5	45 0 0	3 17 4	...	2 3 0	3,042 0 9	...	1,904 3 2
23 14 11	61 19 10	10 3 11	16 13 4	...	...	1 17 7	698 7 8	137 3 11	358 6 8
10 9 0	...	...	...	...	...	0 0 6	325 10 9	...	10 10 10
78 2 1	...	60 16 8	82 4 8	63 12 8	...	16 15 4	1,291 7 1	...	1,876 2 6
9 6 10	4 18 4	13 16 1	38 6 8	...	...	4 9 10	526 11 11	64 1 8	385 16 8
16 6 6	...	...	...	...	...	0 18 10	496 5 9	...	86 17 8
59 18 9	...	16 16 2	42 11 0	...	...	18 0 5	1,478 15 9	...	654 6 8
28 6 0	...	25 10 4	36 0 4	...	...	5 17 5	901 5 9	...	928 0 10
29 0 1	...	0 2 10	6 0 0	...	...	...	468 17 5	117 19 10	...
14 2 8	...	8 2 3	19 19 9	...	...	6 1 6	452 17 7	...	292 7 9
21 14 10	33 6 11	18 8 11	30 0 0	...	...	0 5 6	441 5 4	5 11 11	530 10 0
17 5 7	...	10 12 5	14 9 0	...	...	0 8 7	328 18 7	21 8 5	289 0 0
57 7 9	...	38 1 3	50 0 0	...	...	0 0 10	1,746 17 9	249 18 3	1,050 0 0
77 11 4	...	62 18 2	89 18 6	...	...	27 11 2	2,383 18 5	139 16 8	1,719 3 6
31 3 4	...	6 3 2	8 0 0	...	...	9 9 9	581 9 8	...	200 15 6
16 12 0	...	58 18 0	44 0 0	...	...	9 2 10	611 4 2	53 13 1	1,568 0 0
33 16 6	...	9 10 0	25 7 8	...	...	24 7 0	695 6 9	104 10 5	241 12 10
232 16 4	...	492 3 8	334 18 6	3 16 6	...	150 2 6	5,616 19 4	...	14,880 2 5
37 7 1	...	43 4 0	60 0 0	...		16 4 9	825 14 8	80 10 3	1,035 0 0
17 9 4	...	26 4 9	53 7 7	...	...	22 14 5	766 13 2	...	950 17 10
26 3 10	...	1 19 11	14 6 0	...	...	18 6 5	662 18 7	...	43 1 8
28 14 11	...	...	...	...	...	4 13 0	559 1 0	...	69 2 8
10 8 11	...	...	...	...	...	5 17 10	394 6 8	...	81 8 4
60 13 10	...	116 19 9	114 13 4	...	...	14 8 3	2,661 10 8	...	2,990 11 2
17 9 3	...	19 8 8	23 17 4	...	...	13 11 5	489 17 4	...	597 10 7
2 12 9	...	...	...	...	...	...	158 7 0	15 4 4	...
10 7 0	...	8 13 10	10 0 0	...	...	2 17 6	250 13 2	43 4 8	260 0 0
23 11 11	...	...	...	...	...	1 18 7	724 19 7	9 18 11	...
74 8 10	...	64 0 0	116 15 7	5 1 6	...	3 7 7	1,914 6 11	...	1,327 8 3
41 17 1	...	30 4 9	57 17 6	...	...	61 0 1	1,542 3 7	50 16 10	820 11 3
55 0 2	...	...	...	2 2 0	...	19 11 5	1,203 7 1	...	11 3 1
48 17 6	...	16 6 6	32 10 2	...	...	2 2 0	1,053 2 8	318 12 2	423 5 3
50 13 3	...	71 10 5	93 18 0	...	...	26 2 8	1,585 13 1	96 13 5	1,985 11 2
19 12 2	...	0 7 0	10 0 0	...	...	0 2 0	331 6 3	52 7 9	...
13 2 5	...	...	...	...	...	5 1 4	582 1 2	77 16 4	...
24 19 6	...	44 0 10	53 0 0	...	...	37 1 2	1,652 7 0	...	1,295 3 7
2,274 6 9	330 0 1	2,747 16 8	3,769 3 10	79 19 0	...	891 12 1	71,640 13 3	2,327 4 0	85,427 8 10

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s. d.	£ s. d.
AYR.									
Alloway and Ayr (L.)	...	...	26 5 0	481 15 0	...	3 19 3	6 4 4	26 13 6	17 8 1
Ardrossan	605 1 2	...	181 2 0	7,222 11 3	1,486 11 0	23 4 9	567 16 8	250 6 4	150 11 9
Auchinleck	246 4 3	...	120 0 0	2,653 18 6	7 8 0	10 14 5	76 13 9	154 5 5	95 8 4
Ayr (B.)	2,837 2 7	...	354 8 8	11,200 2 5	7,500 0 0	210 13 4	973 6 7	568 10 8	543 8 5
Ballantrae	...	...	35 0 0	735 18 8	...	6 3 3	13 15 1	26 0 7	56 15 0
Barr	36 12 7	...	16 0 0	420 8 4	...	7 9 4	3 7 2	11 11 7	4 0 7
Beith	136 16 8	8 4 4	123 0 0	2,893 9 10	...	14 15 11	218 4 1	115 1 5	84 12 10
Colmonell	...	14 19 9	28 0 0	761 17 8	...	5 16 0	8 19 10	46 2 3	148 5 7
Coylton	...	...	35 1 8	1,043 4 9	912 8 0	20 11 7	88 11 1	20 9 4	3 9 5
Craigie	...	4 5 0	16 1 0	156 11 3	...	1 3 10	0 7 0	5 9 5	0 8 0
Crosshill	46 12 9	8 15 11	35 0 0	447 8 4	...	11 9 11	8 5 5	17 16 5	50 15 9
Dailly	...	...	25 0 0	641 11 2	15 12 2	15 19 9	9 11 3	24 8 0	17 13 4
Dalmellington	...	...	65 0 0	2,394 6 6	84 1 0	28 19 7	232 16 9	219 0 9	211 12 6
Dalry	1,155 17 5	...	121 0 0	2,988 12 3	...	10 5 1	174 9 0	122 15 2	107 8 3
Dalrymple	...	...	23 0 0	572 0 0	...	8 8 6	20 4 11	48 11 7	19 5 6
Dreghorn	...	...	99 16 4	2,008 13 5	456 4 6	14 6 7	57 1 11	130 18 4	15 6 10
Dundonald	...	...	174 15 6	3,079 4 11	...	48 12 10	323 13 2	143 12 1	230 4 1
Dunlop	175 16 10	...	31 0 0	426 2 5	...	9 11 4	58 6 6	13 14 10	74 2 11
Fenwick	...	...	29 13 0	325 7 6	...	1 13 9	12 3 3	8 12 5	35 16 5
Galston	1,206 14 6	...	84 2 0	2,539 1 10	...	7 10 8	197 8 0	86 17 11	68 13 1
Girvan (B.)	445 2 11	...	88 8 2	1,758 12 4	1,247 11 9	13 1 0	71 16 9	91 6 11	40 13 10
Girvan (L.)	436 14 0	...	33 15 0	889 11 9	...	7 8 7	23 9 10	26 7 9	57 1 11
Irvine (B.)	1,458 13 8	52 13 8	178 0 0	3,753 18 1	3,532 6 6	53 0 5	394 5 11	154 2 8	191 19 1
Irvine (L.)	27 16 7	...	55 0 0	400 15 1	26 19 6	5 6 2	21 3 3	9 0 0	29 1 2
Kilbirnie	1,118 0 8	...	110 15 0	3,120 13 7	...	12 13 1	58 5 7	95 14 8	81 10 1
Kilmarnock (B.)	671 3 5	...	400 0 0	15,094 2 10	212 10 0	132 15 6	993 0 10	747 18 11	633 9 8
Kilmarnock (L.)	92 8 0	...	65 11 0	702 5 0	468 15 0	8 17 5	34 11 0	49 12 5	43 17 7
Kilmaurs	...	...	75 0 0	2,052 1 5	...	8 17 2	117 5 7	71 4 0	101 13 2
Kilwinning	164 13 1	...	155 6 0	2,951 15 4	459 1 1	30 14 1	204 12 2	99 0 2	268 2 10
Auchintiber (Comb.)	80 0 0	...	5 5 0	204 3 4	...	2 1 2	1 6 9	8 13 6	7 9 3
Kirkmichael	...	...	17 0 0	265 15 0	...	2 6 0	3 0 8	3 18 11	15 8 6
Kirkoswald	...	...	25 0 0	638 8 4	...	6 4 8	21 18 10	16 2 6	95 15 8
Largs	145 12 6	...	52 10 0	1,713 18 10	...	8 3 8	99 17 9	28 15 4	174 9 6
Loudoun	...	...	50 0 0	2,932 16 9	...	12 6 4	315 11 4	125 7 8	235 4 6
Manchline	...	...	30 0 0	1,036 12 2	...	4 4 1	26 10 2	36 17 2	251 10 4
Maybole	446 5 6	...	82 0 0	3,592 14 9	...	39 3 4	112 8 10	132 0 6	254 11 10
Monkton and Prestwick	1,392 19 10	...	60 0 0	1,494 8 5	...	5 1 6	96 17 5	75 15 6	65 15 9
Muirkirk	340 16 4	...	89 4 8	2,412 14 9	...	41 2 10	232 13 1	115 17 10	143 19 3
New Cumnock	2,470 14 7	...	132 14 0	2,740 2 6	293 19 6	23 1 0	89 8 11	106 8 5	185 11 7
Ochiltree	...	...	35 0 0	654 5 4	...	3 13 1	45 6 0	22 7 11	27 2 6
Old Cumnock	...	...	95 2 0	2,194 5 9	2,370 10 11	12 12 3	132 19 5	96 3 7	262 3 10
Riccarton	1,825 17 1	...	47 10 0	1,774 9 7	41 18 1	8 8 2	40 12 10	130 12 9	54 6 5
St Quivox	22 9 8	5 4 5	24 10 0	453 16 8	...	3 14 0	4 0 10	13 18 11	10 15 8
Skelmorlie	...	...	31 10 0	402 10 0	...	4 13 5	35 6 10	9 8 7	80 8 9
Sorn	496 4 0	...	52 0 0	1,138 9 10	...	10 11 0	34 2 3	41 13 9	102 2 4
Stair	...	...	19 10 0	377 16 8	...	5 7 11	49 1 4	4 14 9	71 13 1
Stevenston	203 14 10	...	99 5 0	3,485 18 0	1,280 19 3	18 13 0	183 13 0	193 12 3	75 12 0
Stewarton	328 14 1	...	78 0 0	1,314 10 2	344 3 5	18 13 10	94 5 10	109 5 10	329 8 10
Straiton	...	...	23 0 0	512 11 10	...	10 6 6	25 11 8	20 17 7	14 0 10
Symington	31 8 4	...	13 0 0	160 0 0	...	0 18 10	2 7 2	9 9 2	0 10 7
Tarbolton	...	...	67 2 0	1,498 1 1	299 10 6	22 16 11	49 7 8	69 0 7	74 14 5
West Kilbride	61 10 0	...	75 0 0	936 15 1	...	4 2 10	17 18 9	31 10 2	132 3 9
Total of Ayr	18,767 17 10	94 3 1	3,989 3 0	105,649 6 3	21,040 10 2	1,002 9 5	6,684 4 0	4,787 18 8	6,048 15 2

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued*.

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
53 0 4	...	60 15 9	87 0 0	...	...	18 2 6	781 3 9	172 3 6	1,671 10 0
575 8 11	...	675 17 8	699 3 2	4 6 0	...	216 11 2	12,718 11 10	348 16 0	22,561 7 1
194 0 5	...	278 15 9	337 16 8	0 10 0	...	39 17 3	4,215 12 9	...	7,514 10 7
949 4 5	...	926 2 11	1,366 9 8	105 4 6	273 12 0	397 0 11	28,196 7 1	1,411 11 7	34,518 7 8
33 10 1	...	34 11 0	82 10 9	...	...	5 18 9	1,028 3 2	88 9 6	904 12 6
43 16 4	...	20 11 10	34 18 7	...	...	8 2 4	606 18 8	...	734 12 0
280 3 4	64 8 10	170 17 11	212 18 4	7 5 0	...	107 10 11	4,437 9 5	...	5,323 3 10
31 7 0	...	40 15 8	121 3 9	5 18 0	...	17 10 0	1,230 15 6	89 18 6	1,076 7 10
52 14 9	...	...	...	6 16 10	...	45 16 3	2,229 3 8	979 18 0	1,470 0 0
9 4 7	20 0 0	7 17 6	25 0 0	...	...	...	246 7 7	126 5 0	200 0 0
48 9 10	...	23 0 7	66 11 2	1 12 4	...	10 10 2	776 8 7	...	669 10 10
31 6 1	...	33 18 10	67 16 7	...	...	18 18 8	901 15 10	...	1,006 13 0
251 10 10	3 13 7	34 1 7	54 10 0	2 17 0	...	26 14 4	3,609 4 5	...	1,151 6 1
222 16 7	95 3 9	110 9 4	235 9 1	15 13 0	...	74 0 8	5,433 19 7	...	3,478 8 7
53 0 8	...	26 7 8	71 13 5	...	...	19 17 1	862 9 4	44 15 11	689 11 9
113 6 2	...	26 2 5	60 3 3	2 5 0	...	39 19 8	3,024 4 5	1,088 1 11	1,661 17 8
232 7 7	...	279 13 2	506 8 7	1 10 6	...	66 15 7	5,086 18 0	...	9,193 15 9
32 9 10	15 0 0	...	...	...	...	14 1 7	850 6 3	...	64 2 7
19 8 7	...	2 7 10	15 0 0	...	...	9 4 10	459 7 7	68 12 2	52 10 0
211 19 9	...	96 15 7	126 13 4	...	...	42 5 6	4,668 2 2	...	3,600 14 6
64 15 6	...	91 10 1	125 13 7	...	...	41 7 10	4,080 0 8	...	4,205 9 3
31 3 4	...	19 8 1	93 19 1	...	...	22 10 5	1,641 9 9	...	872 17 10
209 5 0	...	540 10 0	498 5 10	20 17 6	2 2 4	220 18 9	11,260 19 5	...	20,641 17 7
24 11 4	...	...	...	1 7 6	...	11 13 10	612 14 5	33 0 3	...
175 14 9	...	190 19 7	331 15 3	6 18 3	...	54 7 0	5,357 7 6	...	6,901 16 3
887 2 2	...	1,615 10 9	1,725 0 0	10 0 0	...	523 0 4	23,645 14 5	8,373 1 2	46,230 0 0
48 19 11	...	15 0 6	...	11 15 0	...	5 8 7	1,547 1 5	495 1 9	1,000 0 0
193 16 2	...	70 10 5	116 13 4	0 4 0	...	43 3 3	2,850 8 6	39 8 11	2,081 13 4
200 10 3	51 7 1	207 3 9	407 0 3	...	...	79 0 4	5,278 6 5	173 9 2	6,194 4 9
13 15 7	...	...	...	...	...	3 10 4	326 4 11	...	91 13 0
18 6 10	25 19 10	18 3 2	45 10 9	...	...	6 4 2	421 13 10	108 17 9	473 5 8
33 19 0	...	17 12 2	43 5 6	...	...	8 16 5	907 3 1	...	484 4 4
153 15 10	...	155 14 0	223 9 4	1 7 0	...	103 15 4	2,861 9 1	...	4,484 8 11
256 0 2	...	585 5 5	603 18 6	15 12 8	...	10 12 6	5,142 15 10	64 18 2	16,133 17 1
87 17 6	...	97 10 9	80 16 10	...	...	16 7 9	1,668 6 9	...	2,608 4 2
179 17 6	...	376 14 2	260 13 5	1 1 6	...	87 12 6	5,565 3 10	145 14 9	10,868 9 3
111 0 10	...	245 2 9	358 11 6	...	...	41 14 0	3,947 7 6	51 2 11	6,812 6 6
207 5 4	...	155 12 9	264 4 11	0 15 9	...	101 5 3	4,105 12 9	84 11 1	4,190 2 0
218 8 11	10 0 0	211 11 10	270 13 4	60 6 2	...	146 18 3	6,959 19 0	59 12 10	7,217 0 0
36 19 0	...	16 17 9	41 13 1	...	...	44 1 6	927 6 2	64 15 11	440 16 11
167 11 8	...	248 11 7	309 9 0	...	...	72 11 1	5,962 1 1	...	7,677 3 8
224 14 0	...	331 3 7	186 0 0	...	...	133 5 10	4,798 18 4	...	10,387 6 7
32 13 0	...	...	...	...	...	11 0 2	582 3 4	...	176 8 4
36 15 7	...	18 6 9	28 0 0	...	...	4 0 0	650 19 11	363 15 8	503 0 0
67 7 2	...	27 3 7	54 0 0	...	...	30 13 6	2,055 6 11	...	1,075 11 10
26 13 1	...	...	...	...	...	...	554 16 10	109 3 8	...
321 10 1	...	332 18 7	194 0 0	84 9 5	...	37 11 8	6,511 17 1	284 5 6	10,950 4 4
94 4 3	25 13 7	64 15 11	86 12 7	...	...	72 2 8	2,960 11 0	...	2,433 11 11
51 0 1	...	39 11 1	77 18 4	...	...	5 1 7	779 19 6	168 13 10	1,063 2 6
17 6 4	...	7 16 4	47 3 8	...	...	30 7 2	320 7 7	...	191 19 10
133 17 3	...	203 4 10	169 3 4	...	...	13 15 6	2,600 14 1	...	5,674 1 2
40 12 2	...	123 12 8	236 8 4	...	...	17 7 10	1,677 1 7	...	3,376 14 2
7,797 15 8	311 6 8	8,877 5 10	11,051 6 1	368 12 11	275 14 4	3,179 3 0	199,925 12 1	15,038 5 5	283,033 13 5

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
BANFF.									
Aberlour	344 0 5	...	67 0 0	1,241 5 10	...	20 14 0	53 7 5	58 14 5	14 6 0
Alvah	101 17 2	...	20 0 0	526 0 6	99 15 4	1 14 0	13 6 11	11 6 10	21 1 3
Banff (B.)	846 0 9	...	121 1 0	2,015 14 1	...	24 3 10	35 6 7	89 5 11	90 18 2
Banff (L.) and Ord	...	...	15 0 0	332 16 4	332 0 0	4 17 5	20 3 10	29 0 9	15 7 4
Boharm	66 14 11	...	20 10 0	546 9 1	25 9 0	2 11 2	12 7 4	14 19 10	82 12 2
Botriphnie	355 12 7	...	15 5 0	307 11 9	...	3 16 8	16 15 11	6 4 6	31 15 10
Boyndie	...	...	22 0 0	839 14 11	202 3 6	4 12 8	12 14 0	37 9 11	23 4 10
Cabrach	...	7 5 0	16 0 0	431 8 2	...	3 13 6	7 3 11	6 7 3	133 5 10
Cullen	330 8 10	...	51 19 6	1,124 3 9	25 15 0	6 4 2	46 3 3	37 11 5	88 13 1
Deskford	67 13 9	3 10 3	16 0 0	275 2 8	...	2 10 8	3 1 8	20 2 1	15 13 0
Enzie	...	...	28 0 0	1,012 7 2	...	14 2 1	47 7 4	22 10 7	61 10 0
Fordyce	915 15 0	...	61 3 9	2,641 12 10	...	23 13 5	95 3 2	179 16 1	57 10 9
Forglen	32 4 2	...	14 0 0	320 5 9	...	1 18 0	10 12 5	5 15 8	6 17 8
Gamrie	...	5 11 6	104 0 0	2,536 5 5	...	13 19 5	55 0 9	63 6 6	105 4 9
Glenrinnes	18 7 5	...	12 10 0	228 19 2	...	1 12 5	6 18 2	4 15 3	7 19 11
Grange	...	...	16 11 8	605 0 10	23 15 0	7 4 5	21 5 7	16 9 4	78 5 7
Inveravon	382 16 3	...	36 0 0	878 11 8	40 18 4	3 5 10	30 14 5	14 0 5	82 3 5
Inverkeithny	...	...	17 0 0	334 8 0	34 16 8	2 13 4	4 19 6	14 18 11	7 18 11
Keith	...	...	93 3 0	2,689 14 2	...	25 0 7	168 15 3	49 12 3	71 18 9
Kirkmichael	139 4 7	...	19 0 6	372 16 7	243 3 4	1 2 5	11 6 2	7 2 9	21 8 8
Marnoch	14 18 4	9 19 11	36 5 0	1,245 13 6	...	11 15 1	37 6 3	38 5 8	151 15 10
Mortlach	768 6 4	...	31 0 0	1,346 15 2	33 13 6	14 2 4	41 16 0	28 1 1	40 2 11
Ordiquhill	155 6 0	...	13 10 0	360 15 10	...	2 5 3	10 19 0	6 8 6	6 1 3
Rathven	...	...	96 10 0	4,965 0 6	272 13 2	30 1 4	177 5 3	194 4 6	215 2 5
Rothiemay	15 9 4	4 9 7	27 9 2	582 1 1	...	7 17 1	22 19 2	17 4 4	83 13 10
Total of Banff	4,554 15 10	30 16 3	970 18 7	27,760 14 9	1,334 2 10	235 16 1	962 19 3	973 14 9	1,514 13 2
BERWICK.									
Abbey St. Bathans	...	...	7 10 0	265 0 0	...	0 18 2	2 18 10	3 9 6	0 10 10
Ayton	...	...	30 0 0	500 3 4	...	7 1 9	36 3 5	26 4 10	87 7 4
Bunkle and Preston	12 16 7	...	9 0 0	180 0 0	...	0 10 4	5 4 3	3 4 1	9 11 4
Channelkirk	...	...	14 5 0	206 0 0	...	0 14 5	2 15 10	7 10 10	29 14 10
Chirnside	3 3 0	...	22 10 0	502 8 9	...	2 9 0	31 18 5	18 4 0	32 6 3
Cockburnspath	41 4 6	...	13 19 11	620 8 4	138 19 1	2 1 0	13 5 9	22 14 9	34 13 11
Coldingham	100 6 8	...	63 0 0	1,162 18 4	...	15 2 3	21 18 10	46 11 3	151 15 2
Coldstream	...	...	37 10 0	951 5 9	...	6 11 6	56 17 11	21 14 10	114 5 3
Cranshaws	...	...	7 17 6	235 0 0	...	0 19 4	6 10 3	2 13 8	16 5 7
Duns	...	...	57 2 0	971 13 5	61 6 3	13 4 4	103 15 2	34 16 7	85 10 1
Earlston	154 10 7	...	22 10 0	592 14 3	...	5 0 11	9 14 4	23 19 5	46 11 1
Eccles	30 6 5	...	37 0 0	629 5 0	...	3 2 8	25 4 10	18 11 3	18 11 0
Edrom	83 7 4	...	25 15 0	579 18 4	...	2 7 5	16 17 6	38 7 10	45 2 3
Eyemouth	52 16 6	...	51 0 0	1,112 0 8	160 0 0	10 5 1	42 11 0	64 1 4	79 14 11
Fogo	42 11 0	1 15 4	12 5 6	262 0 0	38 0 7	1 10 6	4 14 8	9 12 7	13 9 3
Foulden	...	...	10 8 0	177 5 9	...	3 6 5	2 11 0	2 7 9	2 8 11
Gordon	33 10 0	...	12 0 0	315 0 0	...	7 11 8	34 16 2	8 18 2	34 0 2
Greenlaw	...	..	18 10 0	425 10 5	...	2 2 9	15 14 0	10 13 4	24 12 4
Hume and Stitchell	...	...	12 0 0	378 3 4	...	1 8 6	9 13 10	6 16 9	4 16 0
Hutton	90 18 1	...	15 0 0	410 0 0	...	0 16 6	8 14 7	29 13 1	25 6 8
Ladykirk	...	...	10 0 0	182 4 0	...	2 18 6	1 6 6	4 8 11	5 8 3
Langton	53 4 0	...	12 0 0	244 6 8	29 11 8	1 8 9	10 5 1	7 17 8	15 19 10
Lauder	...	...	26 0 0	682 1 0	...	16 0 5	28 8 11	17 2 7	102 12 10
Legerwood	...	...	6 0 0	183 10 0	...	1 7 10	3 15 8	3 13 10	9 8 0
Longformacus	...	...	7 0 0	122 10 6	...	1 15 1	0 6 4	1 10 8	0 18 6
Mertoun	...	...	10 0 0	208 5 2	...	4 15 6	6 8 1	2 6 1	5 19 3
Mordington	32 7 3	2 10 0	7 0 0	151 5 8	...	1 2 4	1 7 4	4 10 4	0 10 0
Nenthorn	...	...	10 0 0	163 1 8	...	3 2 10	11 0 11	3 2 2	141 11 10
Polwarth	70 18 10	2 1 10	11 13 6	174 5 0	430 0 0	4 6 0	4 9 3	10 16 4	0 3 6

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
54 10 7	...	165 3 4	149 0 9	...	...	16 4 0	2,184 6 9	...	5,001 15 1
31 6 0	...	18 14 3	31 0 0	...	...	2 14 0	878 16 3	46 2 2	511 10 0
144 17 3	...	78 19 0	120 16 8	...	...	45 17 6	3,613 0 9	...	3,408 18 11
17 18 3	37 11 4	7 17 6	22 10 0	16 16 6	...	4 8 4	856 7 7	157 5 7	657 10 6
40 7 5	...	35 9 1	47 9 0	...	...	8 10 4	903 9 4	144 11 6	953 16 0
20 6 11	...	17 16 5	26 12 9	...	...	16 13 11	818 12 3	...	492 2 7
36 1 7	...	58 15 6	69 6 4	...	...	4 13 6	1,310 16 9	720 3 2	2,220 8 11
28 19 6	..	7 18 4	25 19 6	...	...	3 0 4	671 1 4	...	261 6 2
49 16 0	...	30 18 1	87 10 2	...	...	51 9 8	1,960 12 11	...	1,824 7 5
14 4 4	...	20 7 5	22 5 1	...	...	0 9 4	461 0 3	...	621 11 8
47 4 8	...	48 9 0	74 11 7	...	...	16 12 4	1,372 14 9	...	1,944 3 7
128 17 3	...	126 18 3	225 17 4	...	...	73 19 8	4,530 12 6	...	3,468 2 1
22 11 0	...	9 18 10	29 6 0	...	...	7 0 6	460 10 0	...	278 17 0
163 15 2	...	59 1 4	197 10 7	...	...	47 5 0	3,351 0 5	52 19 3	1,593 5 6
11 11 10	...	3 19 7	7 3 0	...	...	1 6 2	305 2 11	17 2 10	107 0 0
34 3 9	...	51 14 10	50 9 8	...	...	134 2 9	1,039 3 5	...	1,642 12 9
43 17 5	...	9 11 8	57 7 10	...	...	7 13 8	1,587 0 11	...	621 6 7
11 8 5	...	...	...	...	...	3 19 6	432 3 3	71 19 9	...
211 0 1	...	120 19 6	261 16 10	...	...	35 11 1	3,727 11 6	185 6 0	3,218 0 0
19 2 6	...	22 16 7	27 10 8	1 14 4	...	9 13 5	896 2 6	58 7 4	831 12 0
83 1 0	43 1 10	92 5 2	154 12 1	...	...	7 5 7	1,926 5 3	...	2,654 2 2
140 8 1	17 13 1	178 9 7	227 18 4	0 7 10	...	53 5 1	2,922 0 4	...	5,602 18 10
16 3 8	...	6 19 11	8 13 4	...	...	4 13 10	591 16 7	96 17 4	208 0 0
304 18 3	...	389 9 3	495 2 4	2 7 0	...	130 4 2	7,272 18 2	...	11,006 19 2
32 0 3	29 4 6	24 15 3	53 9 3	...	...	1 17 8	902 10 6	42 7 4	677 3 6
1,708 11 2	127 10 9	1,617 7 8	2,473 19 1	21 5 8	...	688 11 4	44,975 17 2	1,593 2 3	49,807 10 5
18 4 4	...	...	...	...	...	1 9 10	300 1 6	12 5 0	...
37 4 0	...	3 15 10	33 6 8	...	...	...	761 7 2	17 0 6	109 14 2
12 5 2	...	...	...	...	...	0 0 9	232 12 6	3 9 6	...
14 11 10	...	...	...	...	...	...	275 12 9	121 3 4	...
39 18 8	...	14 10 6	29 0 0	1 10 0	...	1 14 10	699 13 5	16 0 11	393 0 0
38 18 3	...	36 4 4	56 0 0	...	...	6 0 6	1,024 10 4	...	1,156 19 3
84 8 4	...	134 9 5	148 19 9	...	...	2 7 8	1,931 17 8	185 9 6	3,300 18 2
71 8 2	...	86 14 4	160 13 6	1 12 0	...	7 13 7	1,516 6 10	41 14 10	2,618 13 9
1 16 11	...	14 5 10	100 0 0	...	...	0 0 11	385 10 0	...	36 5 5
74 2 8	...	94 17 4	174 3 4	...	...	18 13 1	1,689 4 3	...	2,419 3 5
39 11 0	...	24 19 0	54 13 4	...	...	12 0 8	986 4 7	...	784 12 3
36 0 0	...	7 4 4	25 0 0	...	...	6 12 0	836 17 6	38 1 10	187 10 0
41 3 11	...	5 5 4	19 6 0	...	...	3 16 3	861 7 2	68 18 10	131 3 4
71 18 10	...	52 4 7	50 1 5	...	...	11 1 8	1,757 16 0	...	1,592 17 4
12 6 10	...	10 3 9	4 15 7	...	...	1 17 4	415 2 11	66 14 7	263 4 5
6 8 10	...	...	...	...	...	1 5 0	206 1 8	107 1 5	...
29 5 7	...	27 16 8	38 16 8	...	...	1 11 8	543 6 9	...	877 12 8
22 1 0	...	22 19 10	45 17 1	...	...	6 6 1	594 6 10	115 1 1	611 0 2
19 5 0	...	...	...	...	...	3 0 3	435 3 8	65 6 5	...
24 8 3	...	...	...	...	...	1 8 9	606 7 11	...	32 2 9
11 13 4	...	...	...	...	...	0 8 1	216 7 7	18 6 5	...
17 4 3	...	6 6 8	39 14 4	...	...	1 11 4	430 10 3	18 19 3	141 4 6
44 5 3	12 5 1	7 6 3	6 13 4	...	...	14 12 2	957 7 10	189 11 11	190 0 0
11 0 0	11 13 11	14 1 1	23 6 10	...	...	0 4 1	268 1 3	86 9 6	365 18 6
4 2 0	...	...	...	...	...	0 19 0	139 2 1	8 19 1	...
16 12 0	...	...	...	...	...	1 0 0	255 6 1	151 5 5	...
5 14 8	...	...	...	...	...	0 2 5	206 10 0	31 9 3	...
9 14 5	...	...	...	...	...	...	341 13 10	93 7 6	..
7 7 2	...	5 1 6	8 0 0	10 8 6	...	8 1 1	747 12 6	66 14 6	724 0 0

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
BERWICK—*contd.*									
Swinton	82 10 8	...	20 0 0	341 19 7	...	5 13 5	9 10 6	10 18 7	7 15 0
Westruther	376 17 9	...	19 0 0	283 1 6	...	7 15 0	4 11 3	7 6 6	32 16 0
Whitsome	59 0 10	...	12 0 0	293 15 0	...	1 9 9	0 8 11	6 15 5	21 10 2
Total of Berwick	1,320 10 0	6 7 2	629 16 5	13,507 1 5	857 17 7	139 1 11	533 19 4	480 14 11	1,199 6 4
BUTE.									
Cumbrae	...	...	39 12 6	599 15 2	...	7 13 5	39 17 10	21 11 3	57 16 2
Kilbride	21 17 3	21 0 5	30 0 0	822 12 2	...	9 11 5	32 7 7	63 13 0	206 6 1
Kilmory	227 12 8	15 8 0	29 10 0	993 2 10	113 17 1	11 19 1	68 6 8	56 9 4	98 12 10
Kingarth	...	...	25 0 0	415 0 0	...	3 5 6	8 0 9	30 1 9	50 2 3
North Bute and Rothesay (L.)	...	...	24 3 0	388 1 11	...	3 16 8	6 6 5	17 13 4	52 12 6
Rothesay (B.)	...	...	100 0 0	3,958 6 6	700 0 0	57 15 7	233 15 7	88 9 0	200 16 9
Total of Bute	249 9 11	36 8 5	248 5 6	7,176 18 7	813 17 1	94 1 8	388 14 10	277 17 8	666 6 7
CAITHNESS.									
Bower	71 7 1	...	37 0 0	725 0 0	308 13 6	6 13 0	48 5 6	27 16 3	115 13 11
Canisbay	361 11 1	...	34 17 6	791 0 3	...	4 4 0	50 16 8	40 2 3	83 19 5
Dunnet	...	...	27 0 0	503 9 2	...	5 1 1	23 15 7	24 8 11	37 1 5
Halkirk	143 7 4	...	40 0 0	1,387 7 9	79 0 4	11 1 1	54 10 7	41 17 10	141 7 2
Keiss	...	...	30 0 0	543 2 6	...	6 15 7	39 0 2	12 7 2	60 17 5
Latheron	...	25 19 8	96 10 0	2,106 12 3	...	17 18 6	71 17 9	80 11 7	185 11 3
Olrig	201 13 5	...	36 10 0	629 8 10	...	11 7 1	53 0 5	14 7 5	137 4 7
Murkle (Comb.)	142 10 0	...	5 0 0	216 5 0	...	0 12 7	6 6 4	7 2 7	20 7 10
Reay	...	...	36 0 0	493 18 2	50 10 6	7 12 5	43 13 7	11 13 1	45 6 3
Thurso	...	...	93 15 0	2,665 8 1	149 13 6	22 7 1	72 16 6	106 7 9	46 11 9
Watten	...	...	24 0 0	555 1 11	3 6 9	4 11 4	35 6 4	13 11 1	48 5 9
Wick (B.) and Pulteneytown	7,598 6 6	...	165 18 0	4,838 12 7	29 5 10	41 5 4	339 2 10	197 5 11	392 11 4
Wick (L.)	70 3 9	...	111 0 0	1,162 14 4	...	15 14 3	72 13 1	67 7 4	116 17 2
Total of Caithness	2,588 19 2	25 19 8	737 10 6	16,618 0 10	620 10 5	155 3 4	911 5 4	644 19 2	1,431 15 3
CLACKMANNAN.									
Alloa (B.)	530 3 5	51 1 7	226 13 4	6,457 18 1	417 3 10	79 15 5	759 19 10	281 15 7	272 10 11
Alloa (L.)	...	...	70 0 0	2,102 13 11	118 4 10	18 7 1	287 8 5	158 17 7	242 11 8
Alva	11 19 8	...	35 0 0	2,621 8 4	...	24 15 1	172 8 4	92 9 3	124 7 2
Clackmannan	...	...	37 0 0	1,054 11 6	...	5 6 8	47 11 5	75 6 8	113 18 9
Dollar	10 14 4	...	28 0 0	447 4 3	...	3 8 10	19 3 8	14 17 10	161 7 7
Tillicoultry	...	...	63 15 0	2,300 8 2	41 10 4	20 5 10	179 12 0	100 3 10	98 6 3
T. of Clackmannan	552 17 5	51 1 7	460 8 4	14,984 4 3	576 19 0	151 18 11	1,466 3 8	723 10 9	1,013 2 4
DUMBARTON.									
Arrochar	...	...	25 0 0	221 1 1	...	4 12 6	5 4 1	12 10 2	55 11 6
Bonhill	...	...	231 8 6	5,519 3 10	855 13 9	32 13 10	185 14 2	180 6 0	170 3 4
Cardross	430 2 8	...	166 4 10	2,269 12 8	160 0 0	15 1 5	117 10 7	73 17 6	44 16 11
Cumbernauld	1,070 18 2	...	73 0 0	1,356 6 4	...	21 0 0	57 15 3	90 3 8	65 13 11
Dumbarton (B.)	259 12 4	...	300 0 0	8,557 5 2	1,393 15 2	84 18 8	233 1 0	321 11 0	234 7 4
Dumbarton (L.)	...	...	14 5 0	*...	...	0 3 6	...	...	...
Kilmaronock	437 16 11	...	14 0 0	360 14 9	2,603 3 11	6 14 2	8 7 8	26 10 1	50 9 3
Kirkintilloch (B.)	...	...	138 15 4	3,201 16 7	...	18 14 3	227 4 1	124 6 1	326 8 5
Lenzie (Comb.)	882 14 2	...	30 0 0	1,443 15 0	...	17 19 2	73 16 11	65 10 9	59 17 4
Kirkintilloch (L.)	754 12 8	3 13 0	54 11 10	1,181 7 10	37 0 2	4 1 10	60 18 9	32 5 1	38 19 4
Condorrat (Comb.)	209 15 9	...	22 0 0	478 5 7	...	14 12 3	13 15 7	19 10 1	16 5 0
Luss	17 9 1	4 8 5	18 11 0	454 16 8	...	3 10 0	16 7 10	8 0 7	22 3 3
New Kilpatrick	...	14 2 1	311 12 8	4,938 2 4	3,732 6 6	65 2 8	209 14 2	379 12 1	314 11 11
Old Kilpatrick	...	...	630 0 0	14,843 15 8	28,497 13 2	186 4 7	1,254 7 2	929 19 4	1,869 5 9
Roseneath	42 10 1	...	40 0 0	727 0 2	51 0 0	2 18 8	14 13 9	23 14 7	21 4 2
Row	472 0 8	...	155 0 0	4,003 16 1	...	22 18 2	155 14 8	255 7 7	113 18 9
Tl. of Dumbarton	4,577 12 6	22 3 6	2,224 9 2	49,556 19 9	37,330 12 8	501 5 8	2,634 5 8	2,543 4 7	3,403 16 2

* No school under the Board.

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
22 15 2	...	22 14 8	56 17 8	...	...	1 17 5	582 12 8	...	602 3 2
19 19 0	...	7 8 3	3 15 5	...	...	37 13 2	800 3 10	...	512 19 11
14 8 7	...	4 15 5	58 7 5	...	...	2 8 11	475 0 5	...	163 8 3
880 3 5	23 19 0	603 4 11	1,137 8 4	13 10 6	...	155 18 6	21,488 19 9	1,523 10 7	17,244 11 5
50 17 10	...	24 10 6	64 3 6	...	...	77 1 8	982 19 10	...	685 0 5
60 8 0	76 13 3	110 19 7	149 8 11	...	...	34 1 2	1,638 18 10	...	3,388 8 9
29 10 0	...	58 11 7	121 18 0	...	...	99 15 10	1,924 13 11	0 11 0	1,622 16 0
24 7 11	...	18 1 5	38 6 8	...	...	6 13 3	618 19 6	173 11 10	486 0 0
20 6 5	...	17 1 0	45 17 6	1 13 6	...	6 3 1	583 15 4	16 13 8	441 5 0
340 16 11	...	135 19 10	402 6 3	7 6 0	...	108 18 11	6,334 11 4	...	4,319 19 0
526 7 1	76 13 3	365 3 11	822 0 10	8 19 6	...	332 13 11	12,083 18 9	190 16 6	10,943 9 2
46 1 6	...	44 16 6	59 0 0	...	...	14 0 1	1,504 7 4	...	1,650 3 5
65 19 8	...	50 16 3	105 6 8	...	...	13 6 8	1,602 0 5	...	1,727 5 6
36 5 6	...	25 16 11	34 0 0	...	...	4 4 2	721 2 9	22 9 6	713 0 0
67 1 8	...	42 4 4	91 4 10	14 4 4	...	36 10 2	2,149 17 5	...	1,319 16 9
30 3 8	15 7 3	30 18 4	45 16 8	...	...	14 5 3	828 14 0	379 15 9	839 10 0
142 3 9	...	195 2 6	259 10 0	0 15 0	...	29 17 5	3,212 9 8	1,015 17 10	5,310 0 0
34 7 11	51 5 11	46 14 9	49 12 10	2 5 0	...	16 18 9	1,284 16 11	...	1,550 12 9
11 7 4	...	...	...	...	...	2 18 0	412 9 8	...	...
37 1 3	...	67 13 11	72 8 0	...	...	6 5 7	872 2 9	17 18 4	1,865 1 2
156 19 7	54 1 0	183 14 4	250 2 7	6 2 0	...	27 2 8	3,835 1 10	85 7 3	5,142 16 3
29 9 6	...	19 12 0	28 0 0	...	...	0 7 8	761 12 4	407 19 9	532 0 0
363 19 4	...	466 19 2	547 7 8	23 0 0	...	296 6 8	9,300 1 2	...	10,881 8 4
106 4 7	12 14 5	113 8 0	160 0 0	...	...	42 15 11	2,051 12 10	...	3,175 1 0
1,127 5 3	133 8 7	1,287 17 0	1,702 9 3	46 6 4	...	504 19 0	28,536 9 1	1,929 8 5	34,706 15 2
743 8 3	...	289 19 2	477 6 1	7 11 0	...	773 17 5	11,369 3 11	...	9,109 1 6
211 14 5	...	316 10 6	367 18 0	5 17 8	...	24 12 7	3,924 16 8	394 9 4	8,800 13 6
294 19 6	...	191 7 11	280 0 0	...	...	18 18 9	3,867 14 0	...	5,351 12 3
140 0 5	...	105 7 10	145 13 9	...	...	29 7 2	1,754 4 2	18 18 1	3,295 13 10
47 11 9	...	34 11 7	64 0 0	...	...	2 13 5	833 13 3	...	1,006 12 10
140 19 2	...	129 13 11	161 7 4	...	...	37 0 2	3,273 2 0	...	3,666 17 3
1,578 13 6	...	1,067 10 11	1,496 5 2	13 8 8	...	886 9 6	25,022 14 0	413 7 5	31,230 11 2
18 14 2	34 11 6	...	...	...	...	4 12 0	381 17 0	195 0 2	...
276 12 1	20 0 0	211 17 8	358 0 0	3 6 2	...	73 5 9	8,118 5 1	...	6,126 19 4
174 18 6	...	111 11 0	247 6 8	8 15 8	...	28 12 7	3,848 11 0	...	3,382 5 2
118 4 2	136 15 4	178 5 1	283 14 4	8 17 6	...	55 6 11	3,516 0 8	...	5,358 4 8
663 3 10	...	497 14 6	1,006 12 11	10 0 0	...	562 7 7	14,124 9 6	11 10 4	14,977 10 6
...	14 10 7	...	...	...	...	...	28 19 1	59 2 4	18 16 10
24 7 1	9 0 0	52 10 8	86 17 0	16 14 2	...	49 8 3	3,746 13 11	...	5,164 2 8
417 9 6	456 8 4	504 10 2	308 0 2	1 9 9	...	58 12 8	5,783 15 4	...	14,552 15 3
127 4 2	...	...	...	...	...	70 8 8	2,771 6 2	...	665 15 0
105 7 8	16 13 2	109 5 11	189 2 6	0 11 10	...	54 15 3	2,643 6 10	...	3,921 15 1
33 13 6	...	...	...	...	...	3 11 0	811 8 9	...	211 15 11
24 15 5	...	...	...	...	...	7 8 11	577 11 2	47 17 11	...
459 12 6	110 17 6	826 12 6	1,053 7 1	29 3 0	...	138 0 10	12,582 17 10	1,245 14 1	25,284 12 7
1,488 4 8	...	3,039 17 3	2,331 8 5	16 2 0	...	402 11 3	55,489 9 3	4,546 18 11	98,529 16 10
56 16 5	...	...	...	...	...	7 1 3	986 19 1	35 8 2	...
353 19 4	18 5 10	774 8 2	867 14 6	...	...	237 1 9	7,430 5 6	43 3 7	24,798 16 7
4,343 3 0	817 2 3	6,306 12 11	6,732 3 7	95 0 1	...	1,753 4 8	122,841 16 2	6,184 15 6	200,993 6 5

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
DUMFRIES.									
Annan (incl. B.)	340 0 8	...	103 0 0	3,180 11 10	14 8 9	24 0 8	164 1 0	131 9 3	99 6 11
Applegarth and Sibbaldie	...	...	20 10 0	287 7 6	...	2 0 6	11 4 11	3 0 9	44 19 4
Brydekirk	...	...	14 0 0	304 3 6	...	1 16 9	34 10 3	4 4 5	13 1 0
Caerlaverock	...	...	22 0 0	556 18 0	...	14 2 0	20 5 4	20 9 2	36 9 7
Canonbie	386 0 4	...	35 0 0	792 15 6	...	6 8 2	31 15 1	25 18 9	81 5 1
Closeburn	9 10 3	...	15 0 0	228 2 1	...	3 8 6	3 6 5	7 13 4	0 12 0
Cummertrees	96 3 8	...	13 0 0	342 0 0	...	1 15 3	10 13 5	7 10 9	2 3 3
Dalton	...	...	14 0 0	166 8 9	466 3 9	2 13 7	5 10 1	2 7 0	18 17 1
Dornock	5 1 0	...	15 0 0	277 13 4	...	1 18 0	9 16 6	12 3 6	32 12 9
Dryfesdale	299 7 10	...	115 0 0	1,877 0 6	...	18 1 2	74 19 7	46 3 11	67 8 2
Dumfries (B.)	521 18 9	...	200 0 0	3,706 0 5	...	45 16 10	245 1 7	182 13 8	112 3 10
Dumfries (L.)	187 18 2	...	92 2 6	1,686 4 9	...	8 15 6	174 14 2	65 15 5	148 8 11
Dunscore	...	...	20 0 0	469 17 8	...	7 6 0	6 11 8	5 15 8	36 8 8
Durisdeer	9 5 8	...	20 0 0	367 12 7	366 4 6	10 1 5	3 8 4	14 7 3	26 10 8
Eskdalemuir	...	...	11 0 0	250 0 0	...	...	3 10 2	5 17 3	17 16 11
Ewes	...	...	10 0 0	145 0 0	...	0 19 2	1 0 1	10 17 4	26 7 0
Glencairn	109 5 4	...	35 0 0	657 16 7	...	4 3 3	5 17 9	11 9 3	11 12 11
Gretna	107 2 3	...	17 0 0	489 16 7	...	5 10 8	25 17 8	12 19 1	92 6 11
Halfmorton	...	...	12 0 0	193 15 10	...	4 12 3	10 6 5	2 11 9	4 9 8
Hoddam	50 3 5	...	21 10 0	405 8 5	...	3 5 0	22 1 11	5 13 11	111 17 0
Holywood	...	...	17 0 0	464 10 3	...	5 16 2	11 12 1	5 10 4	93 7 0
Hutton and Corrie	34 16 2	3 15 7	17 0 0	418 19 2	586 10 4	13 3 3	10 17 9	7 15 0	49 5 2
Johnstone	2 3 2	...	21 15 0	361 18 9	...	8 5 6	12 9 1	18 10 0	57 5 8
Keir	11 15 0	...	9 0 0	286 10 0	...	1 18 4	2 0 3	11 3 10	4 14 0
Kirkconnel	...	...	19 0 0	595 16 8	1,078 12 0	6 6 11	43 4 0	10 18 5	9 12 8
Kirkmahoe	50 11 11	...	28 0 0	485 15 10	...	2 10 1	6 15 8	14 11 2	11 18 5
Kirkmichael	...	...	19 0 0	363 1 6	...	3 9 6	3 13 6	5 14 9	20 7 0
Kirkpatrick-Fleming	3 5 7	...	16 0 0	661 10 8	107 13 2	9 19 10	44 9 9	10 11 9	8 3 7
Kirkpatrick-Juxta	34 2 5	...	22 0 0	418 12 6	81 2 4	3 19 8	6 14 9	5 6 4	18 1 6
Langholm	112 16 7	...	65 0 0	1,698 7 5	...	5 5 9	104 14 0	46 8 0	33 10 10
Lochmaben (in. B.)	7 8 6	...	37 0 0	974 15 10	...	8 2 11	36 1 0	34 1 10	60 13 8
Middlebie	85 3 0	...	23 2 6	645 4 8	76 16 3	6 18 6	43 4 4	25 9 10	4 15 0
Moffat	...	...	55 7 0	1,312 12 4	...	19 13 2	96 0 0	59 14 7	131 8 0
Morton	15 10 5	...	40 0 0	600 12 0	...	12 17 11	36 18 2	44 11 5	132 14 1
Mouswald	24 17 9	...	7 10 0	235 6 3	...	1 3 1	3 6 8	3 10 2	5 2 7
Penpont	...	...	17 10 0	485 5 2	...	6 3 3	7 3 9	10 2 4	21 8 3
Ruthwell	54 14 3	...	14 0 0	248 0 0	...	0 17 7	1 18 10	8 12 1	11 19 10
St. Mungo	...	3 11 0	18 3 0	218 0 0	...	2 6 0	8 9 6	3 2 11	36 19 3
Sanquhar (incl. B.)	294 12 0	...	26 3 0	1,051 18 1	...	12 10 11	36 3 4	50 1 1	24 2 5
Tinwald	...	...	13 0 0	259 14 0	...	3 12 3	3 2 5	3 7 0	53 16 4
Torthorwald	...	...	20 15 0	432 10 0	...	8 2 9	23 2 0	5 15 0	94 19 2
Tundergarth	14 17 4	3 14 7	16 3 0	193 15 0	...	2 11 6	8 16 9	5 5 8	2 10 0
Tynron	3 5 11	...	6 6 0	257 12 0	...	0 18 0	4 3 9	2 16 0	12 6 3
Wamphray	...	...	9 0 0	195 5 2	...	5 15 0	1 0 2	1 19 10	6 4 10
Westerkirk	8 16 7	...	10 0 0	266 17 8	...	1 11 2	10 18 0	4 15 10	10 6 2
Tota of Dumfries	2,880 13 11	11 1 2	1,352 17 0	29,517 4 9	2,777 11 1	320 13 8	1,431 11 10	978 16 7	1,900 9 4
EDINBURGH.									
Borthwick	122 16 4	...	15 0 0	341 5 0	...	2 3 11	15 5 3	3 5 0	6 12 9
Carrington	...	...	7 0 0	206 14 4	...	3 5 6	20 17 4	4 0 6	3 14 6
Cockpen	4 8 7	...	43 0 0	884 16 1	612 0 6	9 18 9	35 5 2	28 2 2	32 8 4
Colinton	200 15 9	...	71 17 2	2,231 14 0	912 9 4	16 15 10	129 17 7	129 16 5	71 12 2
Corstorphine	...	...	54 0 0	848 0 8	1,153 18 1	10 5 5	30 8 8	54 12 8	56 2 3
Cramond	8 17 2	...	70 0 0	892 15 10	1,798 5 6	15 10 3	95 13 4	101 7 8	143 5 1

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
187 7 7	...	423 9 5	405 1 7	0 14 0	...	33 4 11	5,106 16 7	...	12,836 11 8
16 13 4	...	...	...	...	...	8 6 8	394 3 0	75 18 8	...
21 3 6	...	15 3 0	24 0 0	...	...	3 5 2	435 7 7	55 2 2	446 0 0
35 2 1	...	39 9 7	28 0 0	...	...	6 10 0	779 5 9	167 4 6	966 0 0
50 10 6	...	11 11 10	49 9 6	1 1 4	...	9 12 9	1,481 8 10	...	667 9 7
10 16 6	...	1 16 9	23 6 8	0 18 3	...	2 6 0	306 16 9	162 1 8	34 18 10
22 3 0	...	82 15 0	92 8 0	...	...	17 10 10	688 3 2	38 0 2	2,076 8 0
14 7 6	...	12 8 11	25 6 8	6 0 0	...	16 7 5	750 10 9	...	493 17 11
20 8 11	...	23 10 3	41 10 0	...	...	1 10 3	441 4 6	13 18 0	640 15 0
59 3 1	...	160 9 6	224 3 8	...	...	46 0 3	2,987 17 8	...	4,651 7 0
277 5 8	...	847 17 8	832 0 0	...	...	39 0 4	7,009 18 9	104 11 9	26,666 0 0
130 12 1	...	171 8 4	241 2 4	0 11 0	...	44 13 10	2,952 7 0	...	4,701 9 2
26 11 0	...	22 10 10	50 0 4	...	...	19 14 1	664 15 11	...	602 7 0
20 17 7	...	38 7 9	41 13 4	...	...	6 2 3	924 11 4	87 3 7	1,158 6 8
18 11 0	...	...	...	...	...	0 11 7	307 6 11	75 2 6	...
3 5 10	...	26 3 1	24 19 11	...	...	0 7 6	248 19 11	...	722 13 0
39 14 6	...	32 1 4	45 0 0	...	...	5 8 1	957 9 0	...	791 10 10
23 15 4	...	18 8 0	96 13 2	...	...	8 3 7	897 13 3	...	613 7 11
11 1 5	...	5 15 8	14 7 2	...	...	2 19 8	261 19 10	7 16 10	150 18 0
26 16 3	...	21 0 2	50 11 4	...	...	14 1 11	742 9 4	...	593 13 7
21 11 4	...	20 14 6	30 6 8	...	...	6 2 5	676 10 9	14 2 7	689 0 0
37 14 9	...	21 9 1	34 8 2	7 10 0	...	12 3 2	1,255 7 7	...	898 19 1
26 3 7	...	...	...	...	...	14 6 8	522 17 5	...	35 5 11
19 18 0	...	...	...	...	...	13 12 1	360 11 6	49 1 11	...
28 12 11	...	53 13 7	52 1 8	...	...	5 4 11	1,903 3 9	489 1 2	2,281 5 0
30 19 7	7 13 8	6 15 2	20 0 0	...	...	4 8 1	669 19 7	75 9 6	178 0 0
24 19 7	9 5 1	...	...	...	...	...	449 10 11	38 15 3	...
43 10 5	...	35 16 10	106 12 9	5 7 4	...	5 2 9	1,058 4 5	...	1,046 4 5
23 2 8	12 14 7	13 1 11	24 12 0	...	...	0 13 8	664 4 4	...	374 6 10
194 15 1	...	39 16 11	141 19 1	...	...	25 10 10	2,468 4 6	1 5 2	1,074 5 3
34 8 3	...	40 17 11	75 16 4	...	...	24 1 0	1,333 7 3	130 1 2	1,179 0 0
36 6 3	...	11 3 4	16 0 0	13 0 0	...	28 17 1	1,016 0 9	62 19 2	320 0 0
115 1 6	...	56 7 4	138 9 11	1 3 7	...	7 14 1	1,993 11 6	...	1,588 14 6
19 16 7	...	...	...	...	...	3 12 7	906 13 2	...	95 18 6
6 17 10	...	2 2 2	3 6 8	...	...	1 4 7	294 7 9	10 8 10	66 13 4
22 15 2	...	...	...	...	...	21 15 7	592 3 6	39 5 9	...
13 12 10	...	16 10 0	23 4 0	...	...	5 13 3	399 2 8	...	595 10 7
16 12 8	...	8 13 6	23 3 4	...	...	2 19 6	342 0 8	35 17 0	227 13 4
71 9 6	...	106 15 7	134 13 10	...	...	14 15 5	1,823 5 2	...	3,495 5 4
14 17 2	...	2 12 6	13 6 8	...	...	2 3 9	369 12 1	159 19 8	60 0 0
18 11 2	...	8 1 0	23 0 0	...	...	3 9 10	638 5 11	...	232 12 4
13 9 5	...	15 5 4	12 15 7	...	...	3 11 3	292 15 5	11 14 7	484 10 10
10 16 10	...	...	...	...	...	2 3 9	300 8 6	9 7 3	...
3 7 6	...	...	...	...	...	...	222 12 8	29 2 8	...
6 0 0	...	...	...	...	...	9 19 1	329 4 6	...	16 17 3
1,871 17 3	29 13 4	2,414 3 9	3,183 10 4	36 5 6	...	515 2 5	49,221 11 11	1,941 11 6	73,753 16 8
23 16 5	...	...	...	...	...	20 1 3	555 6 4	45 12 0	...
10 9 2	...	...	...	...	...	2 2 0	258 3 4	125 6 10	...
79 13 8	...	38 7 8	93 6 8	...	...	13 7 9	1,874 15 4	109 13 1	1,646 13 4
204 4 0	...	259 13 1	415 7 10	...	...	68 13 7	4,712 16 9	263 2 7	8,149 4 0
142 17 7	...	104 16 0	151 6 8	21 2 9	...	52 8 5	2,679 19 2	106 14 11	4,346 10 0
83 18 1	14 0 0	...	...	3 4 8	...	31 2 9	3,258 0 4	901 19 3	2,225 0 0

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s. d.	£ s. d.
EDINBURGH—*contd.*									
Cranston	51 2 5	...	15 0 0	423 0 0	...	1 5 0	12 7 5	6 19 3	20 14 3
Crichton	153 10 4	3 6 8	15 0 0	289 12 2	...	0 6 0	6 9 9	16 15 8	12 12 1
Currie	...	...	51 8 8	760 4 8	...	18 3 4	17 15 2	74 2 11	53 17 11
Dalkeith (B.)	103 3 2	...	85 6 0	1,771 19 4	...	11 6 6	54 14 10	179 16 0	25 2 10
Dalkeith (L.)	...	...	22 10 0	434 1 0	...	2 16 0	3 11 10	7 5 7	54 10 5
Edinburgh (City)	...	...	5,058 15 6	116,894 5 10	18,816 7 2	1,109 7 8	7,678 7 3	8,277 10 9	3,804 4 5
Fala and Soutra	24 6 6	2 7 1	6 7 6	136 5 0	...	0 6 6	0 12 6	5 19 2	0 5 7
Glencorse	...	...	12 0 0	479 16 1	...	3 1 6	7 15 8	39 14 6	39 8 8
Heriot	...	...	3 15 0	201 0 0	...	0 17 6	19 5 0	3 10 11	75 6 9
Inveresk (L.)	...	...	126 3 0	1,076 4 10	743 13 10	17 6 8	91 11 11	158 11 7	320 9 0
Kirknewton and East Calder	36 17 4	13 15 3	51 3 4	1,417 14 9	345 0 0	11 19 8	76 5 9	91 16 7	23 6 5
Lasswade	...	...	125 0 0	3,621 8 5	...	28 12 3	150 1 7	319 19 8	291 18 11
Leith (B.)	2,206 3 11	...	1,644 4 5	36,555 7 2	16,465 10 5	365 9 2	2,415 6 11	2,426 15 3	1,323 1 6
Liberton	204 0 6	...	117 10 0	2,650 4 5	...	12 15 11	163 10 9	201 9 4	164 18 8
Mid-Calder	186 5 3	...	45 0 0	1,649 3 7	...	9 1 3	84 14 5	104 14 1	41 8 7
Musselburgh (B.)	...	...	123 0 4	4,456 16 8	1,269 16 9	24 8 11	197 12 9	185 13 11	110 9 6
Newbattle	14 6 1	...	40 0 0	1,567 0 4	2,422 3 6	12 12 3	76 19 1	68 11 11	35 7 0
Newton	..	...	38 0 0	560 0 4	822 10 8	5 5 10	9 17 7	32 16 1	13 9 6
Penicuik	366 4 0	...	60 0 0	1,908 18 10	...	11 13 0	40 8 11	64 0 11	109 19 7
Ninemileburn (Comb.)	...	...	2 0 0	115 10 0	...	0 10 0	1 1 1	10 1 7	5 18 0
Ratho	55 8 5	...	19 14 0	499 0 0	...	4 15 7	11 5 6	29 17 10	71 7 4
Stobhill	...	13 4 7	60 10 0	1,344 0 1	...	17 14 9	38 1 11	42 11 0	14 8 2
Stow	...	...	22 10 0	485 0 0	...	2 9 5	14 13 7	29 10 6	151 12 8
Temple	...	0 19 7	10 0 0	217 6 8	...	0 3 0	6 4 2	2 4 11	10 3 7
West Calder	...	...	169 12 1	3,704 0 3	...	27 2 8	124 4 5	208 2 5	152 3 10
Total of Edinburgh	3,738 5 9	33 13 2	8,185 1 0	188,623 6 4	45,361 15 9	1,757 10 0	11,630 7 6	12,914 16 9	7,240 0 3
ELGIN.									
Alves	334 17 8	4 15 9	20 0 0	463 7 3	80 2 9	8 1 10	4 4 1	18 18 4	24 1 6
Bellie	...	...	25 0 0	491 3 9	...	5 6 7	30 4 3	10 18 7	63 3 9
Birnie	11 0 8	...	14 0 0	273 2 10	...	1 7 3	7 1 4	7 0 1	12 19 0
Cromdale	276 6 0	4 13 2	47 10 0	1,629 6 0	128 0 0	24 3 0	78 9 5	65 10 3	132 3 5
Dallas	217 8 9	4 15 9	20 0 0	359 14 6	...	2 6 11	23 14 2	24 3 6	44 10 3
Drainie	364 16 5	17 17 3	25 0 0	1,795 6 11	466 9 6	13 4 8	30 18 8	92 5 0	18 7 8
Duffus	39 4 0	...	35 0 0	1,806 4 9	93 4 7	27 13 9	66 6 10	90 0 0	71 3 10
Dyke	...	4 15 9	21 0 0	390 19 7	...	1 13 0	12 2 2	32 14 6	10 18 4
Edinkillie	46 3 4	5 4 9	21 0 0	178 0 0	...	1 3 7	2 1 6	17 6 4	12 19 1
Elgin (B.)	838 11 3	...	170 0 0	3,318 3 1	63 13 6	43 16 10	90 17 3	136 3 0	72 16 5
Elgin (L.)	...	...	32 10 0	1,151 3 10	212 7 5	9 4 9	31 12 7	53 11 2	65 14 5
Forres (B.)	767 4 0	34 1 1	101 10 0	1,852 17 3	...	19 17 7	49 5 4	94 6 2	249 16 3
Forres (L.)	...	5 4 9	12 10 0	*...	...	0 4 7	...	...	...
Kinloss	524 17 1	4 19 9	19 0 0	481 7 0	371 0 5	10 15 11	18 2 2	48 4 7	2 6 7
Knockando	471 17 0	...	22 0 0	682 9 2	29 1 8	8 14 7	22 12 1	20 18 4	12 16 2
New Spynie	1 10 11	...	10 17 0	183 0 0	...	0 3 6	0 13 0	4 12 4	2 13 2
Rafford	215 12 3	5 4 9	30 0 0	345 14 6	317 4 9	1 18 6	2 15 10	25 11 1	16 3 5
Rothes	4 19 2	...	44 3 7	1,215 0 11	518 5 9	9 18 7	53 3 9	87 5 3	142 3 3
St. Andrews-Lhanbryde	199 6 11	...	23 0 0	441 16 11	...	2 5 2	4 14 9	10 19 9	56 2 8
Cranloch (Comb.)	192 9 7	...	14 10 6	136 13 9	...	1 2 0	2 7 6	9 6 5	10 9 7
Speymouth	...	...	26 0 0	642 1 9	...	6 14 8	30 5 9	17 8 4	13 6 6
Urquhart	...	4 14 3	22 15 0	388 9 7	...	4 11 5	3 1 3	17 6 0	12 7 11
Total of Elgin	4,506 5 0	96 7 0	757 6 1	18,226 3 4	2,273 10 4	204 8 8	564 13 8	884 9 0	1,047 3 2

* No school under the Board.

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
18 8 5	...	...	...	...	...	7 16 11	556 13 8	...	110 11 5
21 15 9	...	71 19 7	41 6 8	...	...	8 17 1	641 11 9	2 7 0	1,887 0 0
85 18 1	15 0 0	166 1 10	184 10 4	...	...	6 18 4	1,434 1 3	75 3 8	4,669 2 9
144 17 3	...	449 7 4	461 5 9	3 15 0	...	58 4 11	3,348 12 11	...	12,556 1 10
17 0 6	...	...	...	...	...	4 4 8	546 0 0	108 14 9	...
12,632 6 5	28 0 0	14,366 5 0	23,097 6 5	108 17 3	2,596 17 7	6,720 2 0	221,188 13 3	7,353 13 4	443,715 2 2
7 0 0	...	18 9 2	22 2 8	...	...	3 18 3	222 19 11	35 10 8	361 13 8
55 12 10	...	41 8 6	88 0 0	...	...	9 2 3	776 0 0	...	1,126 3 1
15 5 2	...	...	...	...	...	1 2 0	320 2 4	7 8 10	...
142 3 1	...	261 1 3	308 5 0	...	...	48 2 8	3,293 12 10	...	7,696 0 0
97 7 9	...	76 3 0	150 5 11	16 11 0	...	25 10 10	2,433 17 7	56 9 2	2,583 7 7
323 4 10	...	359 13 3	797 4 8	3 16 6	...	57 5 2	6,078 5 3	153 16 10	9,403 10 7
3,921 19 0	...	3,455 16 0	5,211 4 6	37 5 8	...	1,515 15 11	77,543 19 10	6,132 8 4	110,251 7 1
235 10 2	...	216 17 7	359 8 8	1 2 6	...	107 19 1	4,435 7 7	...	5,900 18 3
159 19 10	...	83 6 7	163 10 0	...	...	40 14 6	2,567 18 1	260 14 0	2,432 10 0
217 1 7	...	238 15 8	510 7 6	13 1 6	...	134 16 8	7,482 1 9	113 5 2	7,179 6 11
201 1 9	...	200 1 8	281 1 5	1 4 9	...	4 10 4	4,924 19 4	1,263 6 3	8,521 19 11
45 7 11	...	2 13 0	35 5 4	...	...	2 0 2	1,567 6 5	1,394 10 9	2,049 4 0
185 8 10	45 13 7	97 12 5	221 8 5	...	...	37 3 0	3,148 11 6	...	2,760 17 4
10 7 9	...	...	...	...	...	1 14 2	147 2 7	...	...
68 0 10	7 18 0	18 1 7	36 5 0	...	...	1 14 8	823 8 9	...	551 3 9
96 0 8	...	59 11 11	105 10 0	...	...	15 5 5	1,806 18 6	151 2 5	1,651 10 0
38 3 4	...	81 9 2	162 4 10	...	...	10 18 10	998 12 4	...	2,180 16 7
18 9 0	...	...	...	...	...	0 17 4	266 8 3	41 1 10	...
435 0 10	...	338 14 0	648 8 8	8 16 6	...	15 5 10	5,831 11 6	569 5 7	9,952 10 3
19,738 10 6	110 11 7	21,001 5 3	33,545 2 11	218 17 4	2,596 17 7	9,027 16 9	365,723 18 5	19,271 7 2	654,008 4 6
20 10 8	...	45 16 5	95 2 5	...	...	38 5 11	1,158 4 7	...	1,627 2 10
24 11 8	...	...	...	1 1 9	...	1 2 9	652 13 1	...	37 19 3
11 7 4	...	5 19 6	15 2 0	...	...	19 3 10	378 3 10	...	177 11 9
115 15 7	...	211 16 4	289 3 0	0 10 0	...	50 3 3	3,053 9 5	...	4,986 11 1
22 9 6	...	26 12 5	59 17 2	...	...	46 0 10	851 13 9	...	926 19 10
117 15 8	...	136 4 10	188 3 6	19 17 6	...	91 5 7	3,371 13 2	...	4,336 0 1
134 3 11	...	69 4 0	147 15 2	5 16 9	...	54 17 6	2,640 15 1	65 11 10	1,892 18 8
18 4 0	...	23 1 0	56 11 4	...	...	11 5 11	583 5 7	365 15 7	602 0 11
17 8 1	41 18 2	15 13 8	31 3 0	...	...	16 14 5	406 15 11	57 7 7	416 18 11
262 18 5	...	490 7 6	458 6 7	18 16 1	295 0 7	108 1 3	6,367 11 9	...	15,696 13 7
74 7 7	51 1 2	163 17 2	171 5 0	4 0 8	...	40 11 8	2,061 7 5	421 14 9	4,228 10 10
136 5 1	...	106 3 3	216 8 9	...	...	116 0 0	3,743 14 9	...	3,045 0 5
...	178 12 4	14 18 2	27 19 1	...	...	0 4 10	239 13 9	42 1 4	400 9 6
29 2 0	...	24 18 0	44 7 0	...	...	38 0 9	1,617 1 3	...	1,182 16 7
41 10 0	...	24 10 8	75 6 8	...	...	115 5 0	1,527 1 4	...	952 0 2
10 18 6	...	1 14 7	25 9 9	...	...	6 6 0	247 18 9	76 10 10	23 0 11
22 18 10	...	39 16 10	68 11 5	...	...	21 8 4	1,113 0 6	...	1,416 12 7
81 12 5	...	115 15 6	165 19 1	...	...	61 10 1	2,499 17 4	...	3,519 11 4
19 17 5	78 18 5	6 11 6	14 10 0	...	...	34 4 5	892 7 11	24 16 7	173 6 11
10 0 0	21 2 1	...	...	...	...	6 3 11	404 5 4	...	143 12 3
46 14 5	...	27 14 8	69 9 3	...	...	20 6 6	900 1 10	88 2 0	714 14 11
22 19 11	11 3 5	0 11 7	6 0 0	...	...	14 11 9	508 12 1	114 15 1	12 0 0
1,241 11 0	382 15 7	1,551 7 7	2,226 10 2	50 2 9	295 0 7	911 14 6	35,219 8 5	1,256 15 7	46,512 13 4

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
FIFE.									
Abdie	4 5 9	...	9 0 0	170 0 0	...	0 11 6	6 5 5	6 13 3	1 15 9
Aberdour	...	12 18 10	29 0 0	682 10 8	...	8 13 11	22 11 6	45 17 8	165 14 9
Anstruther Easter	...	...	22 0 0	558 13 4	...	2 16 0	13 4 4	45 5 5	24 13 10
Anstruther Wester	4 18 10	...	15 0 0	169 15 0	...	0 18 9	2 2 10	10 18 4	0 15 0
Auchterderran	1,344 15 5	...	91 15 0	2,715 3 0	1,493 2 0	50 12 6	111 8 0	99 4 4	225 19 1
Auchtermuchty	...	16 9 7	23 1 9	742 7 5	185 7 1	4 3 9	14 11 1	21 15 5	41 19 7
Auchtertool	112 19 1	...	31 4 2	279 2 2	...	6 8 9	14 11 7	4 3 0	7 3 4
Ballingry	...	...	37 0 0	891 10 2	419 7 7	14 10 9	53 1 0	40 15 0	12 9 0
Balmerino	82 12 4	...	11 10 0	283 7 7	...	2 9 8	4 14 2	4 6 8	17 12 9
Beath	3,808 7 7	63 15 6	373 10 0	9,220 11 10	6 2 0	50 19 0	274 9 10	430 11 3	462 13 0
Burntisland (B.)	8 8 1	...	60 0 0	1,868 15 0	...	11 0 1	123 14 9	117 5 10	166 10 11
Burntisland (L.)	...	...	12 0 0	*...	...	0 1 2	...	6 9 0	...
Cameron	8 4 7	...	22 0 0	420 9 2	11 6 8	4 4 10	5 1 9	11 6 10	39 16 9
Carnbee	5 6 0	9 18 6	22 0 0	363 9 9	...	10 14 0	9 6 6	13 5 9	52 8 3
Carnock	...	4 9 3	18 0 0	469 17 3	...	4 14 0	16 19 11	7 17 8	60 12 2
Ceres	166 7 2	...	27 10 0	472 14 2	151 0 6	4 2 2	15 6 4	29 12 2	75 0 5
Collessie	583 6 5	...	25 0 0	815 8 4	...	7 3 10	32 7 0	33 17 5	65 2 1
Crail	...	...	41 0 0	570 16 8	...	2 13 9	7 15 1	26 0 8	5 13 2
Creich	9 7 2	...	8 0 0	198 8 5	...	0 5 0	6 18 10	3 18 3	16 6 4
Culross	...	...	47 2 6	344 9 11	...	14 6 9	6 18 6	23 3 2	65 12 4
Cults	...	...	14 0 0	247 8 4	...	3 1 11	13 0 2	9 8 10	46 9 0
Cupar (B.)	3 14 4	...	55 0 0	1,779 19 5	...	9 8 6	62 2 3	65 9 7	77 5 5
Cupar (L.)	...	...	13 0 0	70 0 0	...	0 15 8	0 19 6	1 11 3	0 7 9
Dairsie	39 16 1	...	12 0 0	264 16 8	...	0 14 4	9 5 8	3 10 1	13 12 9
Dalgety	23 4 7	...	24 0 0	592 11 5	75 4 8	5 15 6	6 15 6	20 19 9	52 15 6
Dunbog	144 15 3	...	2 0 0	205 0 0	111 7 2	1 3 9	18 8 11	3 0 8	4 12 0
Dunfermline (B.)	...	...	297 3 4	9,328 2 10	2,606 2 2	95 4 10	512 9 10	473 13 1	462 11 1
Dunfermline (L.)	...	16 19 4	149 2 6	3,787 19 11	225 6 1	20 10 11	125 4 8	186 8 6	317 19 1
Dunino	1 2 10	...	10 5 0	192 18 1	...	2 5 0	2 4 2	3 14 1	6 10 2
Dysart (B.)	1,364 14 0	...	232 10 0	5,125 10 8	...	58 15 9	206 14 8	255 3 7	561 6 4
Elie	28 12 7	...	14 0 0	420 14 11	...	0 10 0	10 1 8	22 15 2	1 7 0
Falkland	211 1 8	...	23 12 7	847 11 5	27 15 0	7 16 7	36 14 5	19 6 0	48 16 11
Ferry-Port-on-Craig	208 17 0	...	49 0 0	1,587 6 4	...	14 2 2	57 15 3	64 1 9	63 16 9
Flisk	16 10 3	...	7 0 0	210 5 0	...	1 4 2	3 6 7	3 8 6	9 0 5
Forgan	787 8 11	...	70 0 0	1,757 7 9	...	35 7 9	86 19 3	126 18 6	81 7 6
Inverkeithing	...	...	71 11 0	1,455 7 5	154 12 8	7 2 10	127 4 7	61 1 8	150 19 3
Kemback	...	...	11 0 0	181 17 6	...	1 19 6	4 10 5	7 0 7	13 8 11
Kennoway	386 7 1	...	27 0 0	730 12 4	0 10 0	4 13 3	22 12 9	15 0 10	10 1 6
Kettle	...	...	20 0 0	530 1 6	...	6 11 10	13 14 1	17 8 3	8 2 7
Kilconquhar	16 12 7	...	19 0 0	474 12 10	...	4 3 11	10 14 11	33 1 5	10 17 2
Kilmany	...	...	12 10 0	190 0 0	...	1 3 5	5 17 0	3 13 4	1 19 8
Kilrenny	189 15 3	...	68 10 2	1,308 15 10	...	7 12 5	45 5 3	57 7 10	9 13 5
Kinghorn (incl. B.)	...	...	53 0 0	774 8 4	...	4 4 1	19 8 5	78 17 6	53 5 7
Kinglassie	...	...	22 0 0	368 14 3	...	11 14 3	32 0 7	12 4 0	49 18 0
Kingsbarns	...	...	13 10 0	280 9 0	...	2 2 3	2 10 4	4 9 9	4 9 10
Kirkcaldy (B.)	...	...	259 11 8	9,253 14 1	5,604 11 11	141 0 3	177 13 5	618 12 8	606 1 5
Kirkcaldy & Dysart (L.)	122 0 0	22 14 7	60 0 0	753 15 5	...	13 8 1	14 0 8	51 3 0	78 12 4
Largo	358 5 10	...	22 0 0	617 11 8	...	2 6 6	73 2 9	27 10 4	20 7 1
Largoward	12 4 2	7 18 9	21 0 0	* 374 5 8	...	4 4 8	8 7 5	14 4 8	23 6
Leslie	...	...	50 0 0	1,687 14 11	...	10 9 7	199 6 9	82 11 1	156 7 1
Leuchars	...	...	29 1 6	1,019 11 8	...	25 12 0	12 15 10	35 5 6	30 18
Lochgelly	4,572 15 10	...	154 2 6	4,374 18 3	455 2 11	61 5 1	135 3 10	227 9 5	167 10 7
Logie	90 0 6	...	8 0 0	175 0 0	..	0 14 2	1 13 6	5 12 5	1 5 3
Markinch	...	...	156 18 1	3,518 11 1	1,649 19 0	17 1 4	186 3 7	142 6 1	270 6 7
Monimail	...	...	18 0 0	316 6 8	...	3 6 5	6 11 9	6 5 11	12 12 6
Moonzie	...	...	4 7 6	99 9 2	...	1 8 1	4 5 11	2 13 1	81 13 8
Newburgh	...	...	23 15 0	869 12 3	...	4 4 8	75 7 8	25 11 10	34 19 6

* No school under the Board.

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
10 11 4	...	...	...	...	...	0 1 1	209 4 1	91 0 3	...
48 18 9	...	100 19 0	118 4 4	...	...	7 8 0	1,242 17 5	55 13 0	3,137 5 8
49 4 11	...	103 1 0	28 0 7	1 11 3	...	5 10 1	854 0 9	55 2 9	3,069 0 3
10 6 3	...	6 11 4	10 0 0	...	...	0 15 5	232 1 9	...	167 15 3
179 17 0	1 2 0	429 2 8	333 16 8	8 5 6	...	75 18 8	7,160 1 10	...	13,267 19 10
66 5 2	...	111 7 6	104 0 0	...	...	0 14 7	1,332 2 11	...	2,924 6 4
6 15 6	25 6 1	4 17 7	12 10 0	1 13 6	...	4 19 3	511 14 0	22 8 6	126 17 10
78 2 0	...	222 4 9	252 1 8	9 17 0	...	20 10 7	2,051 9 6	...	6,639 1 3
16 0 2	...	...	...	...	...	2 11 8	425 5 0	...	24 17 0
515 15 0	...	1,083 9 7	1,399 0 6	16 18 10	...	160 16 0	17,866 19 11	845 10 2	30,885 2 4
167 1 4	...	239 6 2	338 12 7	...	...	40 0 4	3,140 15 1	128 8 2	7,113 16 2
2 0 0	110 0 0	25 18 8	60 0 0	...	...	1 8 9	217 17 7	86 6 2	696 0 0
27 7 2	...	12 5 3	18 6 8	...	...	0 8 10	580 18 6	...	398 7 3
22 10 2	...	7 17 6	13 6 8	...	...	7 15 8	537 18 9	55 10 3	213 6 8
36 6 7	...	7 12 1	24 0 0	1 1 0	...	12 5 6	663 15 5	337 19 1	216 0 0
44 9 10	5 4 0	...	...	...	...	23 12 2	1,014 18 11	...	161 8 3
74 15 1	...	26 5 1	31 13 4	...	...	23 12 4	1,718 10 11	...	681 9 1
38 9 10	5 5 0	85 7 10	41 5 4	...	...	0 16 6	825 3 10	18 0 0	2,362 13 1
6 18 11	...	...	...	...	...	0 16 3	250 19 2	...	9 15 9
12 9 2	...	59 10 8	84 0 0	...	...	8 19 5	666 12 5	266 14 9	1,638 0 0
22 8 9	...	21 1 2	21 11 4	...	...	4 1 0	402 10 6	...	582 3 6
206 5 7	...	75 16 2	69 12 11	...	...	58 11 4	2,463 5 6	63 9 3	2,123 0 10
7 16 6	40 19 0	...	...	...	...	0 3 5	135 13 1	9 4 1	...
14 3 10	...	...	...	...	...	9 8 0	367 7 5	...	15 18 7
49 10 3	...	0 11 3	16 2 5	...	...	9 8 0	876 18 10	...	2 17 4
10 4 4	...	5 0 1	7 10 0	...	...	10 12 7	523 14 9	14 5 11	292 10 0
947 9 2	...	1,082 11 3	1,363 9 3	3 3 6	100 0 0	407 4 11	17,679 5 3	...	32,633 17 0
369 2 6	167 18 6	285 16 5	593 10 0	...	...	46 8 5	6,292 6 10	286 2 4	7,962 9 9
4 0 0	...	0 7 9	5 0 0	...	...	0 1 6	228 7 10	38 19 2	5 0 0
451 12 8	...	329 5 5	555 15 0	...	...	167 4 10	9,308 12 11	...	10,416 2 5
24 10 6	...	2 17 4	13 6 0	...	...	52 19 0	591 14 2	219 9 11	66 9 0
52 10 7	...	8 2 9	30 0 0	3 11 11	...	36 16 8	1,353 16 6	32 15 3	210 0 0
114 19 7	...	49 6 9	131 16 8	4 17 0	...	12 3 9	2,358 3 0	...	1,551 0 8
6 9 11	...	1 15 9	10 4 3	...	...	1 17 6	271 2 4	...	61 7 0
189 17 2	...	173 18 3	261 10 10	2 4 4	...	56 12 10	3,629 13 1	...	5,255 15 7
84 7 5	...	51 17 7	80 0 0	...	...	40 5 4	2,284 9 9	865 18 9	1,533 6 8
13 17 4	...	12 10 7	22 13 4	...	...	2 2 2	271 0 4	21 9 8	338 0 0
70 16 4	...	33 5 9	54 10 0	3 2 6	...	9 17 0	1,368 9 4	...	1,184 10 3
43 9 8	...	31 8 8	81 13 4	...	...	12 5 2	764 15 1	290 14 5	840 0 0
36 10 6	...	3 12 2	16 10 0	...	...	3 6 7	629 2 1	188 18 1	90 15 0
15 6 1	...	...	...	...	...	0 1 0	230 10 6	19 7 11	...
97 17 3	...	127 16 1	81 17 1	...	...	4 18 3	1,999 8 10	...	4,014 5 10
98 16 10	9 0 0	76 1 11	190 7 0	...	...	27 16 11	1,385 6 7	35 15 0	2,007 0 1
24 8 3	25 0 0	15 12 6	66 13 4	1 10 6	...	1 16 0	631 11 8	114 2 2	366 13 4
12 3 0	...	2 11 5	10 0 0	0 6 0	...	0 0 10	332 12 5	127 7 7	65 0 0
785 8 9	...	1,341 3 3	1,582 6 1	...	1,094 15 1	232 8 2	21,697 6 9	1,193 15 3	39,456 6 8
55 1 8	12 5 0	79 15 6	97 6 8	...	...	19 3 1	1,379 6 0	159 8 5	2,312 0 0
34 6 9	10 18 0	12 16 6	47 1 6	...	...	19 13 0	1,245 19 11	212 6 2	330 19 8
22 9 1	48 1 2	8 11 3	9 13 4	...	...	1 1 1	555 7 7	17 13 4	256 3 4
160 7 2	...	102 5 9	305 2 11	...	...	29 4 11	2,783 11 0	...	3,094 5 9
44 19 5	...	38 10 6	77 17 4	...	...	34 10 5	1,349 2 6	136 0 0	1,066 10 8
356 16 1	...	505 1 2	732 12 10	21 15 2	...	173 12 1	11,938 5 9	922 13 5	15,855 6 10
6 17 5	...	...	...	...	...	1 7 5	290 10 8	...	24 10 8
205 10 10	...	350 15 10	576 8 3	17 5 2	...	36 1 1	7,127 6 11	400 14 7	11,403 6 10
25 2 3	...	10 10 0	110 0 0	2 2 0	...	0 0 6	510 18 0	33 0 2	160 0 0
11 5 1	...	...	...	...	...	0 2 11	205 5 5	9 12 6	...
57 10 11	...	26 10 1	25 19 9	...	...	12 0 0	1,155 11 8	174 12 0	741 18 2

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
FIFE—*contd.*									
Newburn	..	...	10 0 0	133 7 6	...	1 5 1	2 19 11	1 17 0	7 6 7
Pittenweem	..	...	35 11 0	695 11 8	...	5 3 8	50 17 1	15 16 2	30 19 10
St. Andrews (B.)	244 0 10	...	59 1 8	2,086 1 5	145 13 7	12 14 2	77 1 7	83 10 11	117 11 2
St. Andrews (L.) and St. Leonards	...	...	32 0 0	505 6 8	189 2 9	6 15 10	11 1 2	19 2 7	42 13 9
St. Monance	311 3 6	4 3 6	34 0 0	743 14 8	...	5 7 6	10 7 5	44 6 2	51 6 8
Saline	0 7 5	14 7 0	19 8 4	410 17 4	...	6 10 5	6 16 7	13 10 0	19 10 3
Scoonie	855 16 5	...	49 3 4	2,386 4 5	...	24 6 9	118 2 3	112 3 2	108 19 10
Springfield	...	...	19 2 0	295 15 0	...	1 10 5	2 14 5	9 6 9	13 3 6
Strathmiglo	20 12 9	...	33 0 0	790 3 3	...	...	54 10 9	24 0 7	26 10 1
Torryburn	...	11 2 2	17 0 0	389 17 6	...	3 5 1	8 12 1	10 18 2	46 5 6
Tullialian	...	...	29 4 0	802 5 8	...	5 9 2	57 12 3	23 6 6	40 16 10
Wemyss	182 18 2	...	231 14 0	7,175 12 8	309 7 6	68 0 1	138 16 3	276 12 8	527 9 5
Total of Fife	16,331 16 3	184 17 0	3,592 8 7	93,425 10 2	13,821 1 3	935 3 9	3,611 14 1	4,405 18 8	6 085 7 0
FORFAR.									
Aberlemno	66 13 5	9 12 5	15 0 0	396 0 0	...	0 17 0	2 9 7	6 6 4	17 11 5
Airlie	...	...	6 11 6	198 0 0	...	2 7 5	1 0 11	3 11 7	59 17 0
Arbirlot	13 16 8	...	20 10 0	302 18 2	...	2 0 2	1 15 0	3 6 11	22 4 11
Arbroath (B.)	1,074 3 2	...	257 2 8	7,744 10 2	...	37 18 2	276 4 6	573 8 2	247 15 7
Auchterhouse	35 17 6	...	11 11 0	272 0 6	...	1 0 0	3 0 10	5 0 11	44 16 11
Barry	105 18 0	...	77 5 8	1,747 1 2	341 15 10	11 12 11	59 18 8	66 0 7	123 15 9
Brechin (B.)	...	...	89 10 0	3,690 3 11	...	26 17 9	165 8 0	104 14 7	340 7 2
Brechin (L.)	...	...	41 13 0	546 9 8	...	3 18 6	17 11 11	17 19 0	72 8 8
Broughty-Ferry(B)	61 12 10	...	218 11 0	5,012 8 9	...	69 12 3	221 10 3	256 10 2	263 0 3
Careston	...	3 14 0	7 0 0	196 9 2	363 1 5	0 12 6	5 17 0	5 3 6	0 2 6
Carmyllie	...	...	23 0 0	546 11 8	...	4 14 8	30 19 4	16 3 1	25 16 0
Cortachy & Clova	...	...	18 0 0	441 0 0	...	6 6 10	4 9 0	9 2 4	8 11 3
Craig	292 11 8	...	70 0 0	913 1 6	...	6 13 3	28 19 8	48 8 6	37 17 5
Dun	...	...	23 1 0	218 10 0	...	2 13 2	9 13 3	5 11 5	23 0 11
Dundee (B.)	3,097 10 8	...	2,069 10 10	58,528 4 2	13,290 3 3	530 11 8	2,753 6 5	2,957 14 5	2,633 13 4
Dundee (L.)	...	...	17 0 0	532 1 7	...	0 18 11	14 0 10	18 7 5	2 13 1
Dunnichen	54 19 6	...	29 0 0	490 19 0	...	1 12 2	38 7 0	10 5 10	22 6 7
Eassie and Nevay	21 18 3	...	13 0 0	199 5 1	...	4 8 3	9 13 8	5 0 3	86 6 2
Edzell	201 7 2	...	8 10 0	416 13 5	...	0 15 0	4 7 11	16 4 8	1 17 1
Farnell	...	...	15 0 0	273 10 0	...	1 10 0	23 2 5	3 9 4	113 3 6
Fern	2 0 7	...	9 9 0	160 0 0	...	0 7 6	18 19 9	2 13 2	6 11 3
Forfar (B.)	2,566 18 9	...	104 17 0	4,565 9 9	1,187 2 2	19 6 5	273 15 3	219 6 0	168 1 7
Forfar (L.)	29 8 7	...	28 0 0	417 11 1	...	5 2 8	28 9 5	15 11 11	65 5 11
Fowlis Easter	...	...	10 0 0	213 0 0	...	0 16 3	1 9 0	2 11 9	0 15 3
Friockheim	...	...	27 10 0	391 1 10	0 10 0	12 6 0	18 3 5	20 16 6	34 16 9
Glamis	28 16 10	...	21 0 0	390 1 1	...	3 16 6	4 12 2	8 6 5	26 16 9
Glenisla	...	...	15 0 0	488 10 0	...	4 3 5	5 1 4	4 13 3	25 5 4
Guthrie	52 2 11	6 6 7	6 0 0	247 5 10	...	0 16 6	7 14 9	3 2 5	23 13 11
Inverarity	177 8 1	...	22 0 0	427 17 8	...	2 10 6	3 2 4	6 9 3	36 16 7
Inverkeillor	...	...	23 18 2	547 19 6	...	0 8 1	6 3 7	12 7 6	45 19 10
Kettins	2 1 5	...	16 0 0	295 0 0	...	1 17 6	16 2 5	3 19 2	22 3 0
Kingoldrum	28 15 10	...	7 0 0	142 7 1	...	3 8 8	1 15 11	5 7 10	2 17 0
Kinnell	...	...	15 10 0	223 18 10	...	2 19 0	5 4 11	3 19 8	20 16 6
Kinnettles	3 4 9	...	9 10 0	212 17 0	...	0 13 10	2 3 5	2 13 2	9 17 11
Kirkden	15 9 11	...	12 10 0	187 0 0	...	1 19 5	7 2 9	3 15 1	1 15 4
Kirriemuir	259 17 9	...	50 0 0	2,400 18 11	...	15 5 8	70 0 1	56 13 0	149 3 8
Carroch (Comb.)	...	...	6 0 0	82 10 0	...	0 13 6	0 10 10	2 19 11	7 14 7
Roundyhill (Comb.)	...	...	7 10 0	195 0 0	...	0 11 0	3 5 11	4 4 6	10 17 7
Liff, Benvie, and Invergowrie	...	...	30 0 0	657 3 6	244 4 0	16 19 3	6 1 7	45 6 3	36 16 8
Lintrathen	...	...	26 0 0	426 3 2	289 14 6	9 1 0	40 5 7	9 1 8	3 11 1
Lochlee	90 14 9	...	9 0 0	178 1 8	...	2 13 6	5 9 7	2 14 9	33 7 8

School Boards for the Year ended the 15th May 1906.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
8 19 7	...	1 0 9	14 11 8	...	...	...	181 8 1	27 7 1	15 1 8
23 1 2	...	10 19 5	44 4 0	0 7 6	...	2 14 11	915 6 5	22 9 8	279 18 0
187 17 4	...	231 15 10	247 1 10	1 12 6	...	309 7 3	3,803 10 1	...	6,968 4 0
37 12 3	...	39 4 1	52 13 8	...	...	5 17 10	941 10 7	...	1,143 5 2
38 5 5	...	17 8 2	62 5 3	...	...	19 14 7	1,342 2 10	139 13 10	490 4 11
29 4 4	...	...	...	...	...	25 4 11	545 16 7	56 19 5	...
286 3 11	...	178 2 9	288 6 8	...	...	46 4 4	4,453 13 10	...	5,523 5 4
17 19 1	...	9 6 6	14 0 0	...	...	...	382 17 8	10 14 10	252 0 0
64 11 1	...	30 14 9	80 4 8	...	...	7 15 6	1,132 3 5	...	758 6 3
23 8 11	...	34 17 4	43 0 0	...	...	0 5 3	588 12 0	244 15 10	1,040 10 0
56 2 9	...	57 2 2	80 0 0	1 17 0	...	123 11 5	1,277 7 9	312 9 9	1,530 0 0
675 10 6	...	515 12 2	751 13 9	19 12 0	...	132 14 8	11,005 13 10	8,054 12 4	22,837 11 10
7,597 9 11	460 18 9	8,519 6 8	11,795 1 3	122 14 2	1,194 15 1	2,607 19 5	174,692 1 7	16,419 11 2	260,891 0 7
15 11 0	...	...	...	...	...	3 14 11	533 16 1	32 5 5	...
8 6 9	19 12 2	5 14 9	26 0 7	...	...	0 13 0	331 15 8	7 18 5	139 13 10
10 19 3	...	...	...	...	...	1 13 0	379 4 1	...	6 11 4
602 10 0	...	693 14 10	1,314 16 8	4 18 0	179 10 0	405 18 9	13,412 10 8	...	19,935 18 1
11 14 2	...	8 15 11	22 16 4	...	...	5 3 8	421 17 3	44 8 6	228 9 1
187 16 1	...	111 18 8	340 4 5	2 10 0	...	28 16 11	3,204 14 8	...	3,311 1 11
249 6 8	...	289 12 0	375 16 11	...	191 1 10	78 5 1	5,601 3 11	45 7 1	7,998 8 4
26 5 0	...	13 19 3	52 7 7	...	...	0 0 11	792 13 6	49 4 6	413 18 2
296 1 10	...	526 9 3	896 18 1	2 3 0	...	74 8 9	7,899 6 5	...	14,865 1 7
6 2 6	...	19 1 11	21 13 4	...	...	26 11 9	655 9 7	...	853 8 9
28 9 3	...	25 19 4	25 3 8	...	...	0 16 10	727 13 10	54 18 10	716 13 10
30 8 3	...	25 7 0	38 0 1	...	...	38 11 10	619 16 7	52 8 0	686 6 9
83 1 10	...	67 1 6	145 6 6	...	...	23 1 10	1,716 3 8	211 2 1	2,061 7 6
22 10 0	...	2 14 9	19 9 11	...	...	1 2 10	328 7 3	33 11 11	78 0 0
5,097 4 11	...	4,277 7 1	6,927 16 8	166 19 6	...	552 4 7	102,882 7 6	6,946 10 2	137,505 1 11
18 18 0	...	...	...	...	...	11 12 0	615 11 10	47 18 11	...
17 18 3	...	13 6 0	20 0 0	...	...	7 18 6	706 12 10	...	369 16 7
13 19 3	...	8 16 7	22 1 8	...	...	21 10 4	405 19 6	...	300 5 2
24 6 9	...	54 14 2	66 13 4	...	...	3 7 11	798 17 5	30 12 6	1,633 6 8
21 2 4	...	...	...	...	...	3 9 9	454 7 4	...	32 8 5
10 12 0	...	12 1 4	19 0 0	..	...	1 15 7	243 10 2	10 13 10	330 10 0
358 9 4	...	209 15 3	296 3 0	23 0 8	0 15 3	107 4 11	10,100 5 4	2,598 9 8	11,750 6 6
22 18 1	...	35 5 11	35 0 0	2 12 0	...	2 14 3	687 19 10	...	909 19 1
8 2 0	...	...	...	...	...	1 2 10	237 17 1	34 19 10	...
28 11 5	...	60 6 8	45 6 0	...	...	0 7 5	639 16 0	27 2 2	1,514 6 6
31 19 2	20 13 9	12 8 1	67 11 11	0 19 5	...	5 11 3	622 13 4	...	295 2 10
14 18 0	...	15 2 4	15 0 0	...	...	0 10 6	588 4 2	116 10 3	344 10 0
12 5 9	...	...	...	...	...	5 9 2	364 17 10	...	96 6 10
20 15 8	...	0 11 3	15 4 0	...	...	7 1 8	719 17 0	...	213 3 7
53 7 6	...	...	...	4 12 6	...	25 9 11	720 6 7	253 16 8	...
20 12 5	...	21 17 1	78 10 7	1 2 11	...	6 14 8	486 1 2	50 10 3	587 4 8
12 5 1	15 13 6	35 19 9	71 19 4	...	...	6 9 2	333 19 2	...	1,214 18 7
17 16 8	...	14 4 8	25 0 0	...	...	0 8 8	329 18 11	22 13 1	337 0 0
10 0 0	...	...	...	...	...	0 11 3	251 11 4	...	9 6 7
13 1 7	...	...	...	...	...	3 7 11	246 2 0	13 1 1	...
119 16 0	51 4 5	200 5 0	358 15 4	...	...	56 17 6	3,788 12 4	...	5,629 12 4
2 0 0	...	...	...	...	...	1 17 8	104 6 6	...	...
8 18 3	...	...	...	...	...	4 5 3	234 12 6	...	...
35 19 7	...	34 3 6	77 3 5	...	...	5 13 7	1,189 11 4	...	1,178 18 10
19 14 0	...	...	...	...	...	19 19 5	843 10 5	101 10 5	300 0 0
11 16 10	...	...	...	...	...	2 13 2	336 11 11	...	64 3 3

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
FORFAR—*contd.*									
Logie-Pert	153 0 8	...	20 0 0	472 12 6	...	14 14 11	14 0 4	15 0 8	49 0 7
Lunan	...	3 12 5	7 0 0	196 10 0	...	0 17 9	4 15 7	3 5 11	...
Lundie	127 0 8	...	7 0 0	113 15 0	...	4 16 8	4 16 7	3 7 9	5 19 4
Mains and Strathmartine	93 2 2	...	45 7 0	1,095 17 3	2 17 6	4 5 6	14 9 2	63 3 8	85 4 5
Marytown	...	...	12 0 0	156 5 0	...	1 12 6	6 5 7	3 6 4	7 9 2
Menmuir	59 3 5	...	15 11 6	221 5 8	...	1 9 6	6 0 5	3 6 1	6 8 8
Monifieth	...	...	53 10 0	1,143 8 6	164 9 9	10 19 0	30 7 3	53 18 6	18 7 5
Monikie	...	...	32 6 3	588 15 6	...	12 18 11	19 0 8	17 11 0	44 18 2
Montrose (B.)	473 5 8	...	184 4 0	4,506 8 2	...	46 2 6	163 14 4	369 2 3	160 19 10
Montrose (L.)	...	...	17 0 0	278 1 8	...	3 7 0	18 18 10	13 1 8	13 1 3
Murroes	35 4 9	...	7 2 0	322 7 6	...	1 8 2	11 5 0	17 15 7	29 4 7
Navar & Lethnot	...	...	6 10 0	125 12 0	...	0 9 6	1 15 9	1 11 1	24 10 10
Newtyle	3 13 6	...	15 0 0	287 12 6	...	3 14 9	7 2 11	5 10 6	212 15 5
Oathlaw	81 19 10	3 13 1	8 17 0	163 0 0	...	1 8 7	0 17 1	2 18 4	11 18 8
Panbride	200 17 5	...	25 0 0	560 5 0	...	8 2 10	28 11 6	6 5 0	58 17 8
Rescobie	0 4 11	...	8 0 0	170 0 0	...	0 14 0	7 8 10	1 18 3	4 1 7
Ruthven	105 6 6	...	8 11 6	185 12 6	11 2 6	2 8 4	2 1 8	2 14 10	5 17 0
St. Vigeans and Arbroath (L.)	...	...	40 0 0	555 0 0	...	3 18 10	18 7 1	17 15 4	37 6 10
Stracathro	24 12 4	...	6 12 6	236 16 8	...	1 15 0	18 19 0	3 13 4	13 6 2
Tannadice	200 13 0	...	18 18 0	470 0 0	279 11 10	4 7 0	38 12 7	12 7 11	32 16 1
Tealing	3 5 10	...	13 0 0	301 7 7	...	4 6 4	9 17 6	7 13 3	1 2 7
Total of Forfar	9,841 19 8	26 18 6	4,039 0 7	107,866 2 4	16,174 12 9	956 14 4	4,624 17 10	5,194 9 5	5,703 15 11
HADDINGTON.									
Aberlady	...	...	17 10 0	265 10 0	...	1 0 9	1 18 7	11 10 6	11 2 9
Athelstaneford	...	...	17 0 0	321 9 2	...	0 18 7	11 1 9	5 0 2	49 1 3
Bolton	...	...	9 15 0	158 14 0	...	0 13 7	8 9 10	2 16 8	5 19 1
Dirleton	36 0 4	...	41 10 0	828 12 7	...	6 16 0	19 11 7	39 17 2	50 11 1
Dunbar (B.)	1,069 16 3	5 2 10	60 0 0	1,451 0 7	...	5 16 11	79 5 3	59 12 10	28 19 2
Dunbar (L.)	42 18 6	...	42 0 0	649 7 3	320 6 9	11 10 0	17 2 3	22 14 6	14 3 9
Garvald	...	...	11 0 0	190 0 0	...	1 15 2	3 12 2	9 4 6	0 13 10
Gladsmuir	...	...	38 0 0	784 15 10	...	4 6 7	8 19 6	29 13 0	31 9 11
Haddington (incl. B.)	...	...	125 0 0	1,287 19 10	...	14 3 10	63 0 3	65 12 10	52 0 3
Humbie	...	1 9 6	15 0 0	216 17 6	...	0 6 7	3 10 4	3 3 9	..
Innerwick	63 1 1	...	8 3 0	270 0 0	...	0 18 1	1 3 6	5 3 5	0 3 0
Morham	...	...	10 0 0	173 10 0	157 15 0	0 18 5	3 5 10	7 18 11	3 13 5
North Berwick	5 1 6	...	50 0 0	1,231 2 0	...	8 16 0	38 10 4	67 8 11	31 15 10
Oldhamstocks	76 16 2	...	13 0 0	212 0 0	...	1 7 8	0 19 6	3 3 10	5 11 0
Ormiston	1 14 2	3 10 9	22 10 0	577 7 1	...	1 14 6	9 12 2	32 10 8	23 18 0
Pencaitland	...	...	20 0 0	320 3 4	...	0 16 6	26 9 2	12 8 11	6 11 2
Prestonkirk	17 15 4	...	29 2 6	682 9 2	...	4 8 3	9 7 8	29 0 8	36 5 7
Prestonpans	...	...	67 0 0	1,487 4 3	...	24 12 8	20 0 10	133 15 11	36 8 3
Salton	109 13 3	4 0 0	8 10 0	222 0 0		1 3 0	11 17 7	7 17 3	1 7 6
Spott	7 8 1	...	16 0 0	211 4 2	20 15 0	1 17 0	0 14 11	4 11 8	9 16 1
Stenton	...	...	11 0 0	275 0 8	...	1 7 9	2 14 0	18 2 0	10 2 11
Tranent	129 19 6	...	105 0 0	2,755 1 3	3,162 0 5	22 3 5	38 2 7	129 2 1	94 17 0
Whitekirk and Tyninghame	25 15 0	...	21 0 0	382 11 6	...	2 9 0	5 12 5	14 5 2	65 4 7
Whittingehame	...	...	8 0 0	169 10 0	...	1 5 10	0 14 10	3 4 2	1 15 0
Kingside (Comb.)	...	..	3 3 0	57 0 0	...	0 7 6	0 4 9	...	0 19 9
Yester	...	1 15 1	13 5 0	343 15 0	...	0 11 3	8 2 10	8 11 9	7 12 3
Tl. of Haddington	1,585 19 2	15 18 2	782 8 6	15,524 5 2	3,660 17 2	122 4 10	394 4 5	726 11 3	580 2 5

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
22 4 6	...	27 16 8	39 2 0	...	...	9 11 10	837 4 8	212 18 10	628 16 6
8 5 8	...	...	...	...	...	0 15 2	225 2 6	40 4 3	...
10 15 6	...	...	...	...	...	5 17 0	283 8 6	...	37 3 3
49 13 3	...	79 6 6	94 0 0	...	...	13 14 4	1,638 0 9	...	1,625 1 10
19 7 8	...	5 9 10	20 15 2	...	...	0 13 7	233 4 10	42 4 5	136 2 7
13 8 4	...	...	...	...	...	2 7 3	329 0 10	15 19 11	...
106 5 5	...	78 5 7	170 1 10	...	...	27 1 2	1,856 14 5	98 19 6	2,250 11 8
50 16 0	...	45 6 4	102 17 6	...	...	1 5 11	915 16 3	170 0 1	1,267 8 11
553 2 11	...	842 0 11	1,111 6 4	35 12 7	58 15 5	95 17 10	8,600 12 9	384 6 7	24,788 6 8
2 9 5	...	5 6 8	...	...	...	0 11 3	381 15 8	101 13 3	66 13 4
17 10 0	...	22 10 11	54 8 1	...	...	4 0 2	522 16 9	...	604 0 6
3 2 10	...	0 11 5	16 7 2	...	...	0 1 3	180 11 10	22 7 6	...
18 17 2	...	6 5 5	43 14 7	...	...	5 10 2	609 16 11	29 5 1	135 7 8
10 4 5	...	4 6 6	10 0 0	...	...	3 2 3	302 5 9	...	79 12 11
63 15 2	...	...	...	...	...	1 16 4	953 10 11	...	182 5 11
4 14 0	...	...	...	...	...	0 8 0	197 9 7	20 18 2	...
8 14 1	...	...	...	...	...	9 4 10	341 13 9	...	100 6 3
36 4 1	...	10 2 0	54 18 0	...	...	7 19 11	781 12 1	103 12 5	233 14 3
26 3 9	...	...	...	...	...	5 15 11	337 14 8	17 3 7	...
28 12 11	...	12 14 6	38 0 3	...	...	12 13 11	1,149 8 0	2 4 7	450 0 0
10 10 0	...	12 15 9	31 8 6	...	...	0 8 9	395 16 1	51 0 10	333 16 6
8,698 17 0	107 3 10	7,946 15 7	13,212 5 5	244 10 7	430 2 6	1,764 5 9	186,632 12 0	12,098 12 7	248,830 16 3
16 11 9	...	1 18 0	15 19 10	...	...	33 6 8	376 8 10	123 6 9	33 17 10
20 12 10	...	2 1 0	30 11 6	...	...	...	457 16 3	74 11 5	27 19 1
8 18 7	...	...	...	...	...	0 3 1	195 9 10	42 2 4	...
60 13 9	...	50 2 2	103 15 0	...	...	4 16 4	1,242 6 0	83 6 8	1,363 10 0
88 5 9	...	118 18 10	165 19 8	9 4 0	...	88 18 1	3,231 0 2	...	4,446 10 4
47 17 0	...	34 12 1	132 6 6	...	...	7 3 5	1,342 2 0	46 1 7	1,074 0 2
10 12 6	31 4 5	9 19 8	19 6 8	...	...	0 18 7	288 7 6	76 18 0	328 12 10
38 7 8	...	34 4 9	70 10 9	...	...	2 18 3	1,043 6 3	82 17 4	957 1 3
151 6 0	...	234 10 10	234 18 0	1 1 9	187 15 11	39 4 3	2,456 13 9	241 13 3	6,622 9 2
6 5 6	61 6 9	28 3 5	46 13 5	...	...	0 5 0	383 1 9	149 6 10	762 2 1
9 10 0	...	5 10 3	28 0 0	...	...	0 7 9	392 0 1	59 4 3	126 0 0
7 10 0	...	13 10 9	13 15 6	...	...	3 11 8	395 9 6	24 11 3	522 2 6
113 4 9	...	212 0 6	310 14 8	...	157 3 9	33 18 9	2,259 17 0	181 0 10	5,995 2 0
8 0 0	...	1 1 0	20 0 0	...	...	1 0 5	342 19 7	...	28 17 2
54 4 0	...	62 13 2	69 15 8	...	...	10 2 5	869 12 7	8 13 5	1,644 1 4
21 5 7	...	14 0 11	32 6 8	1 9 0	...	2 7 10	457 19 1	251 2 5	404 13 4
38 12 0	...	15 8 9	86 13 4	0 9 0	...	4 12 3	954 4 6	...	358 18 10
83 12 10	...	173 16 10	262 18 8	2 10 11	...	13 13 0	2,305 14 2	165 8 1	5,114 16 8
19 14 0	...	17 19 1	32 0 0	...	...	9 5 5	445 7 1	28 11 11	489 0 0
11 2 0	...	0 12 9	18 5 3	...	...	1 11 7	303 18 6	...	9 7 5
12 9 1	9 12 1	50 11 9	42 18 3	...	...	1 16 0	435 14 5	126 13 5	1,413 0 2
172 15 1	...	244 10 11	354 16 7	8 12 4	...	43 8 3	7,260 9 5	163 4 8	9,607 16 0
27 6 8	...	10 2 6	42 17 2	...	...	1 2 4	598 6 4	40 17 5	257 2 2
8 15 0	22 8 0	...	...	...	...	2 0 0	217 12 10	45 14 10	...
1 17 6	...	...	...	...	...	0 0 6	63 13 0	4 3 5	...
30 9 1	...	16 6 9	46 13 4	...	...	4 1 6	481 3 10	26 0 10	413 6 8
1,069 18 11	124 11 2	1,352 16 8	2,181 16 5	23 7 0	344 19 8	310 13 4	28,800 14 3	2,045 10 2	42,000 7 0

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s. d.	£ s. d.
INVERNESS.									
MAINLAND.									
Abernethy and Kincardine	...	...	29 0 0	545 9 11	...	7 2 6	23 6 5	14 15 3	31 11 11
Alvie	...	...	16 0 0	317 7 6	...	2 15 0	10 4 8	4 9 2	16 13 7
Ardersier	78 13 7	...	28 10 0	464 1 8	...	1 13 0	14 1 9	9 7 8	77 18 6
Arisaig and Moidart	16 2 5	4 2 1	28 0 0	374 0 0	...	8 14 6	21 2 2	35 2 5	17 7 1
Boleskine and Abertarff	...	13 5 8	33 10 0	541 5 6	2,184 1 5	20 16 5	59 0 6	44 12 1	23 2 0
Croy and Dalcross	...	...	35 0 0	507 18 3	...	5 19 3	14 15 4	17 1 6	26 12 1
Daviot and Dunlichty	...	...	32 12 0	577 0 0	...	5 17 0	24 13 8	24 15 2	8 18 8
Dores	99 14 1	...	34 0 0	523 8 1	...	4 12 6	24 19 0	17 0 6	45 16 11
Duthill & Rothiemurchus	97 7 2	12 17 7	35 0 0	909 10 1	...	5 11 2	15 2 10	26 7 7	8 7 8
Glenelg	...	...	42 0 0	618 11 10	107 16 8	10 12 11	43 10 1	30 13 9	79 2 0
Glengarry	52 13 6	...	20 0 0	278 13 4	...	2 7 9	18 4 1	4 13 8	0 1 10
Insh	...	...	15 2 6	170 9 6	...	2 11 7	9 10 3	3 0 3	10 19 1
Inverness (B.)	488 15 11	...	300 0 0	8,550 8 0	827 1 1	91 12 6	275 5 4	452 10 4	336 3 4
Inverness (L.) and Bona	223 18 8	...	188 2 1	1,524 14 7	229 5 3	43 16 2	89 6 5	100 6 9	100 1 7
Kilmallie	824 9 3	35 2 11	127 0 0	1,628 18 2	2 18 6	17 11 9	66 3 1	69 12 8	64 10 1
Kilmonivaig	...	16 15 11	55 0 0	594 19 1	...	10 10 9	36 8 7	15 8 3	88 5 0
Kilmorack	92 16 1	...	49 6 0	827 0 0	...	4 1 11	18 1 3	31 19 2	86 17 1
Kiltarlity	20 1 11	...	34 16 0	838 16 8	28 1 9	8 2 9	18 17 8	39 7 0	29 8 3
Kingussie	63 17 7	...	40 0 0	1,235 11 0	1,936 8 3	20 18 9	29 11 9	55 0 4	26 3 6
Kirkhill	...	...	41 6 0	576 10 10	...	7 4 10	7 12 5	18 10 7	6 3 9
Laggan	...	...	31 10 0	433 19 2	...	3 11 2	26 11 6	9 2 6	42 10 9
Moy & Dalarossie	63 9 5	...	19 8 0	375 1 10	...	3 6 10	29 3 7	8 16 11	22 13 10
Petty	0 16 4	...	37 0 0	486 15 0	...	0 7 11	16 2 9	22 0 10	23 2 6
Urquhart & Glenmoriston	209 9 1	...	42 10 0	990 10 0	...	5 7 10	104 10 11	49 19 6	38 0 1
INSULAR.									
Barra	363 11 4	...	77 13 4	887 7 4	55 6 0	10 1 8	73 0 11	35 16 10	8 2 7
Bracadale	2 6 10	...	39 8 0	334 1 0	...	10 19 3	31 1 0	29 16 7	13 8 6
Duirinish	...	...	46 16 0	1,128 3 8	557 0 0	23 9 4	112 12 3	93 14 2	93 1 2
Harris	...	...	95 4 4	1,713 2 7	...	24 6 6	170 16 1	73 7 11	161 9 1
Kilmuir	15 15 11	...	27 0 0	367 16 7	...	9 4 0	35 1 6	16 3 7	41 0 9
North Uist	392 6 7	..	55 0 0	1,762 19 0	...	17 12 1	152 17 6	103 12 6	128 7 7
Portree	...	...	48 13 0	1,472 13 9	270 9 2	21 13 2	77 14 3	63 15 9	54 15 11
Sleat	...	...	30 10 0	779 1 0	...	19 3 0	56 18 1	48 15 6	35 13 7
Small Isles	...	2 18 0	9 10 0	169 10 0	...	...	4 14 6	3 2 5	4 0 2
Snizort	...	...	36 17 6	772 3 8	...	16 16 4	60 6 9	38 8 6	48 14 10
South Uist	252 18 4	...	110 18 0	2,038 18 8	...	23 9 1	129 7 3	68 13 0	65 7 4
Stenscholl	...	...	27 0 0	572 9 0	...	7 15 8	59 12 10	20 18 0	59 1 6
Strath	...	...	37 10 0	999 17 6	...	16 15 9	89 3 3	60 3 1	22 15 11
Total of Inverness	3,359 4 0	85 2 2	1,956 12 9	36,889 3 9	6,198 8 1	496 12 7	2,049 12 2	1,760 19 8	1,946 10 0
KINCARDINE.									
Arbuthnott	...	...	14 0 0	324 12 0	...	1 17 7	11 15 11	2 4 11	11 12 0
Banchory-Devenick	5 7 8	...	41 5 0	798 15 6	199 10 0	11 6 10	11 1 11	17 11 0	23 1 1
Banchory-Ternan	...	...	67 0 0	1,201 5 2	286 11 0	18 4 5	64 13 9	54 3 10	168 6 8
Benholm	...	...	26 10 0	526 2 8	...	4 17 1	7 12 1	12 3 8	41 6 6
Bervie (incl. B.)	...	...	32 0 0	837 14 7	...	5 19 6	16 15 0	19 4 2	34 8 11
Dunnottar	335 13 7	...	35 0 0	954 19 8	...	6 15 2	19 19 4	29 8 0	46 14 8
Durris	21 8 8	...	15 0 0	409 0 0	...	5 6 3	7 16 10	7 10 1	10 19 10
Fettercairn	119 0 1	...	19 1 0	606 3 4	...	3 5 8	16 0 5	16 11 0	40 1 8
Fetteresso and Rickarton	...	...	75 0 0	1,924 16 6	...	19 7 9	42 7 8	57 4 11	113 19 4
Fordoun	440 7 4	...	20 0 0	738 18 8	...	6 14 4	41 2 8	41 2 2	107 9 8
Garvock	...	...	8 0 0	103 17 8	...	2 1 9	3 12 4	5 17 3	26 18 8
Glenbervie	20 0 4	6 2 6	12 0 0	400 17 6	...	3 3 11	13 15 2	12 2 6	9 15 10
Kinneff and Catterline	...	...	17 10 0	346 0 6	...	3 4 3	7 9 6	5 15 9	68 12 3

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
30 13 0	...	26 0 2	49 16 3	3 5 9	...	1 6 4	762 7 6	...	804 4 10
34 0 4	...	...	...	...	...	1 1 0	402 11 3	100 11 5	...
22 2 7	...	0 13 3	18 18 8	2 2 6	...	7 4 0	725 7 2	...	141 15 11
24 15 7	...	9 8 5	57 8 0	...	...	10 16 9	606 19 5	0 13 7	209 6 0
37 3 4	26 0 4	55 17 6	88 0 6	...	...	40 16 9	3,167 12 0	...	2,956 0 2
29 12 1	...	26 15 5	73 5 9	...	...	13 17 6	750 17 2	52 10 10	631 11 7
37 0 5	...	20 10 5	73 16 0	...	...	13 8 8	818 12 0	...	531 0 11
37 17 2	...	3 7 10	73 10 10	...	...	14 13 1	879 0 0	...	129 15 9
36 0 0	...	35 16 0	57 14 2	...	...	6 1 9	1,245 16 0	...	1,101 3 7
62 13 11	...	39 10 2	48 9 10	2 12 9	...	17 8 6	1,103 2 5	...	1,897 2 0
26 16 6	...	...	...	...	...	3 11 9	407 2 5	...	59 15 9
12 13 3	...	0 18 2	9 19 0	...	...	7 4 0	242 7 7	18 15 0	17 15 1
736 17 7	...	653 3 11	987 10 8	23 4 2	...	317 13 4	14,040 6 2	489 18 3	19,596 12 7
104 7 2	...	68 15 4	104 13 4	...	...	62 13 11	2,840 1 3	...	1,970 6 8
81 8 5	...	85 5 6	171 10 0	0 12 6	...	103 12 2	3,278 15 0	...	2,914 14 9
34 12 0	...	16 18 11	23 6 8	...	...	7 0 4	899 5 6	67 2 6	466 13 4
54 11 0	23 9 11	9 19 8	131 8 2	...	...	22 1 11	1,351 12 2	...	307 13 3
46 8 9	20 0 3	14 12 7	60 6 3	...	...	4 9 5	1,463 7 3	...	377 9 9
65 9 6	...	34 16 2	93 10 1	4 3 0	..	8 18 0	3,614 7 11	...	2,734 6 5
23 10 0	...	8 5 6	5 4 7	...	...	11 14 10	706 3 4	142 2 2	212 10 1
31 14 9	...	11 14 3	26 5 0	...	...	3 2 3	620 1 4	78 3 9	315 0 0
22 12 9	...	14 12 2	25 0 0	...	...	2 7 11	586 13 3	85 19 6	512 10 0
30 7 5	...	7 8 9	35 0 0	...	...	9 11 10	668 13 4	23 16 11	172 8 6
48 2 3	...	58 3 9	80 0 0	...	...	24 9 0	1,651 2 5	...	1,653 2 10
46 8 3	...	82 1 0	93 0 0	65 12 7	...	4 7 10	1,802 9 8	16 9 11	2,289 0 0
20 18 4	...	22 2 7	23 14 9	0 14 9	...	3 6 1	531 17 8	57 0 7	624 11 4
42 2 4	...	91 16 3	99 5 7	17 1 7	...	30 18 4	2,336 0 8	384 17 10	2,066 4 3
40 17 11	...	143 5 1	168 2 3	16 6 6	...	23 0 1	2,629 18 4	1,272 13 7	3,701 14 9
13 12 0	...	30 0 11	30 15 9	5 16 2	...	8 11 2	600 18 4	...	797 5 5
75 19 3	...	136 0 11	151 16 4	9 17 2	...	22 13 1	3,009 2 0	9 3 0	3,700 19 7
72 0 4	...	100 17 7	125 17 3	18 9 2	...	7 5 0	2,384 4 4	120 14 6	2,804 2 7
26 4 6	...	49 18 4	59 3 5	...	...	2 3 6	1,107 10 11	286 19 10	1,367 10 8
7 12 6	...	...	...	...	...	1 5 6	202 13 1	228 5 0	...
21 19 3	...	54 6 9	51 12 8	3 1 2	...	5 15 1	1,110 2 6	288 13 11	1,466 4 10
72 8 1	...	105 19 11	134 0 0	44 19 6	...	6 5 2	3,053 4 4	...	2,042 18 2
31 6 2	...	27 4 4	35 4 3	...	...	22 16 2	863 7 11	...	781 1 3
31 6 4	...	70 2 11	79 14 7	14 1 4	...	16 3 9	1,437 14 5	243 16 4	2,043 8 0
2,174 5 0	69 10 6	2,116 10 5	3,347 0 7	232 0 7	...	869 15 9	63,551 8 0	3,968 8 5	64,448 0 7
16 3 0	7 0 8	6 1 0	9 6 8	...	...	2 8 4	407 2 1	28 3 10	186 13 4
24 8 9	...	66 1 1	121 14 0	...	...	29 10 8	1,949 13 6	...	1,961 7 6
78 18 0	...	100 12 6	178 16 2	...	...	23 7 4	2,241 18 10	...	3,385 14 11
36 15 11	...	11 19 2	73 6 0	...	...	2 0 11	742 14 0	79 12 6	337 6 8
46 15 11	...	32 16 5	84 0 6	...	...	25 14 8	1,135 9 8	72 2 1	858 15 1
87 10 11	17 2 5	80 2 8	158 19 3	...	...	33 10 9	1,805 16 5	...	2,459 7 4
18 3 6	...	34 8 6	33 15 6	...	...	2 8 11	565 18 1	42 11 10	949 16 2
43 15 0	...	7 14 4	16 0 0	...	...	5 13 2	893 5 8	...	231 13 3
126 0 0	...	121 14 10	261 11 7	1 8 6	...	49 3 1	2,792 14 2	277 19 9	3,296 1 11
74 6 5	64 7 10	93 4 0	77 10 0	...	...	20 0 8	1,725 3 9	...	2,787 15 6
8 0 0	21 16 4	...	...	...	...	5 11 8	185 15 8	1 11 6	...
25 2 5	...	36 10 1	52 9 4	...	...	6 0 11	598 0 6	24 13 8	1,038 0 3
25 13 9	...	22 1 10	26 0 0	...	...	19 13 11	542 1 9	...	579 19 2

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
KINCARDINE—*contd.*									
Laurenceklrk .	...	...	39 0 0	880 15 6	...	13 6 10	36 6 10	33 11 10	64 19 4
Maryculter . .	...	...	20 0 0	370 19 0	...	11 17 11	7 13 3	9 16 10	31 15 0
Marykirk . .	...	...	33 0 0	443 0 6	...	3 12 6	11 3 6	11 5 3	25 13 7
Nigg . . .	...	...	30 4 0	566 11 5	...	10 16 6	33 18 11	17 7 11	36 8 3
St. Cyrus . .	...	...	27 0 0	534 1 9	...	4 1 0	42 14 6	17 14 0	121 12 10
Strachan . .	26 9 9	...	8 0 0	371 1 7	...	4 14 8	5 14 5	14 8 10	15 6 6
Tl. of Kincardine	968 7 5	6 2 6	539 10 0	12,339 13 6	486 1 0	140 13 11	401 14 0	385 3 11	999 2 7
KINROSS.									
Blairingone . .	...	...	15 0 0	290 13 4	...	1 8 8	7 0 5	4 9 11	2 2 4
Cleish . . .	16 4 6	...	10 0 0	204 0 0	...	0 10 0	1 5 5	2 7 4	2 2 8
Fossoway & Tullibole . . .	128 8 8	...	19 0 0	435 3 11	61 19 10	4 11 3	11 12 7	11 6 6	30 1 1
Kinross . .	...	...	51 10 0	967 9 6	3,908 16 0	0 17 6	36 11 11	34 16 1	35 2 7
Orwell . . .	50 4 4	...	21 10 0	341 16 8	...	1 18 4	10 10 1	15 7 1	19 8 1
Portmoak . .	...	...	15 0 0	308 16 8	...	0 17 11	4 7 9	2 6 3	7 1 6
Total of Kinross .	194 17 6	...	132 0 0	2,548 0 1	3,970 15 10	10 3 8	71 8 2	70 13 2	95 18 3
KIRKCUDBRIGHT.									
Anwoth . .	49 7 5	...	17 2 0	450 0 0	...	5 14 11	11 17 1	10 15 6	29 13 9
Balmaclellan .	...	...	25 0 0	295 18 3	...	7 17 0	23 6 5	10 3 4	26 8 3
Balmaghie . .	...	...	14 5 0	394 8 4	...	3 8 11	10 9 4	9 17 4	42 14 11
Bargrennan . .	76 9 4	2 13 7	12 0 0	186 8 5	...	1 16 6	5 6 6	3 16 0	7 10 10
Borgue . .	52 17 3	...	18 0 0	559 0 8	...	6 10 6	5 16 9	15 11 2	14 5 4
Buittle . .	...	...	20 0 0	372 14 10	...	2 3 0	11 15 8	3 7 11	1 16 4
Carsphairn . .	23 4 11	...	7 0 0	230 17 0	...	2 12 1	16 15 7	4 10 8	43 3 1
Colvend . .	63 11 1	17 5 0	19 0 0	595 0 8	...	4 16 6	29 5 6	11 17 6	48 17 5
Corsock . .	...	...	12 0 0	180 0 0	...	0 6 6	5 12 0	3 16 10	3 8 11
Crossmichael .	45 19 6	...	17 0 0	549 3 5	...	6 10 3	20 16 10	8 2 3	61 9 1
Dalry . . .	...	...	23 0 0	445 0 0	17 13 9	2 3 0	13 9 6	15 17 3	10 0 0
Girthon . .	35 4 9	...	20 10 0	295 19 2	...	3 6 4	11 15 3	10 8 2	6 12 0
Irongray . .	...	...	11 0 0	353 9 2	...	1 12 6	14 1 4	4 16 1	77 7 3
Kells . . .	68 10 2	...	18 13 4	535 16 8	...	6 6 11	29 18 8	13 9 6	20 13 1
Mossdale (Comb.)	38 9 7	...	5 0 0	90 0 0	...	0 6 4	4 15 10	2 14 4	19 9 6
Kelton . . .	255 3 5	...	61 0 0	2,054 16 5	...	31 15 7	136 4 11	41 9 6	78 2 3
Kirkbean . .	92 1 6	...	20 0 0	365 10 10	78 4 2	10 13 6	34 8 7	7 7 3	15 14 8
Kirkcudbright (including B.) .	81 2 5	...	70 0 0	1,067 2 7	...	6 9 10	35 17 1	35 7 5	112 4 0
Kirkgunzeon .	...	...	13 0 0	167 0 0	...	2 18 9	6 0 1	4 4 5	4 5 3
Kirkmabreck .	465 15 3	15 18 9	20 10 0	671 13 5	653 19 11	9 3 4	59 1 5	12 9 10	52 14 1
Kirkpatrick-Durham . . .	49 3 10	...	12 0 0	255 0 0	...	0 7 4	3 2 7	4 4 2	4 5 9
Lochrutton . .	...	...	11 0 0	191 18 11	...	6 11 6	9 7 9	2 9 8	15 7 4
Minnigaff . .	365 7 0	5 8 10	16 0 0	492 7 6	1,591 6 5	6 14 8	35 7 2	30 15 3	7 11 8
New Abbey .	61 0 3	...	17 10 0	445 8 7	...	3 11 0	9 4 1	17 9 9	29 3 6
Parton . .	50 18 0	...	12 0 0	213 4 7	...	1 5 0	7 3 1	2 1 4	17 15 0
Rerrick . .	48 17 8	...	28 16 10	616 17 6	...	1 14 9	13 3 5	12 17 5	64 19 0
Terregles . .	...	...	15 0 0	118 6 8	40 15 7	4 9 8	5 4 5	3 1 5	8 10 11
Tongland . .	...	...	11 0 0	261 2 6	...	2 14 3	5 0 11	3 0 5	3 10 10
Troqueer . .	...	...	120 0 0	2,210 18 11	...	29 11 8	134 11 5	73 2 10	101 15 11
Twynholm . .	...	...	18 16 0	269 2 7	...	2 19 10	8 9 10	6 18 4	23 2 0
Urr . . .	246 11 7	...	61 10 0	2,472 8 3	354 6 7	8 2 5	196 17 8	46 15 3	87 0 3
Tl. of Kirkcudbright	2,269 14 11	41 6 2	747 13 2	17,406 15 10	2,736 6 5	184 14 4	914 6 8	432 18 1	1,039 12 2

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
71 17 11	39 15 3	27 10 10	129 8 7	0 3 4	...	19 8 11	1,356 5 2	...	665 17 6
21 10 0	...	44 8 11	56 4 1	...	...	5 13 9	579 18 9	...	1,434 3 9
25 18 0	...	23 4 7	87 11 3	...	...	1 8 8	665 17 10	...	843 19 5
53 8 10	...	33 12 7	67 0 0	6 6 0	...	18 5 1	873 19 6	191 5 11	923 10 0
33 5 1	...	11 2 9	20 0 0	...	...	9 6 7	820 18 6	...	415 19 5
18 19 3	...	25 15 6	25 6 8	...	...	3 8 6	519 5 8	...	715 13 1
836 12 8	150 2 6	779 1 7	1,478 19 7	7 17 10	...	282 16 6	19,801 19 6	718 1 1	23,071 19 3
13 11 10	...	6 15 3	10 0 0	...	...	2 7 10	353 9 7	70 18 2	185 0 0
9 10 2	37 10 0	...	...	...	...	20 5 11	303 16 0	120 12 3	...
20 16 10	...	13 2 1	31 11 0	0 6 6	...	4 2 2	772 2 5	141 1 2	352 12 0
78 9 1	5 11 4	66 1 6	52 8 1	...	...	107 15 6	5,345 9 1	1,662 15 3	5,727 4 11
17 15 6	19 9 6	...	...	1 5 6	...	10 14 5	509 19 6	33 3 1	...
11 5 8	...	...	...	...	...	1 17 0	351 12 9	52 10 8	...
151 9 1	62 10 10	85 18 10	93 19 1	1 12 0	...	147 2 10	7,636 9 4	2,081 0 7	6,264 16 11
52 2 4	...	...	...	...	...	10 7 3	637 0 3	...	260 11 0
18 15 7	12 15 9	9 3 6	40 7 3	3 4 0	...	0 5 6	473 4 10	12 8 4	263 5 5
22 1 7	27 0 0	16 14 1	58 4 7	...	...	6 5 8	605 9 9	...	488 15 9
12 1 9	26 8 1	9 12 8	24 0 0	...	...	28 13 5	396 17 1	...	304 16 0
50 13 11	...	3 11 9	10 0 0	...	...	4 15 4	741 2 8	10 8 7	95 0 0
18 3 6	...	16 14 3	15 10 0	...	...	11 2 10	473 8 4	65 12 2	434 0 0
18 14 5	9 14 3	25 5 3	37 10 0	...	...	2 5 5	421 12 8	6 14 8	693 15 0
21 15 9	...	22 4 5	42 19 8	...	...	12 3 3	888 16 9	...	695 18 8
13 8 9	...	11 13 6	8 6 6	...	...	...	238 13 0	74 3 7	353 0 1
30 1 2	...	2 14 10	27 0 4	...	...	11 6 1	780 3 9	13 0 1	70 13 5
26 8 10	7 6 2	16 10 5	81 13 4	...	...	2 10 6	661 12 9	75 15 8	410 16 8
12 7 0	103 10 5	18 10 0	37 10 0	...	...	9 1 7	564 14 8	0 1 4	472 10 0
20 17 6	...	...	...	...	...	0 18 9	484 2 7	72 10 0	...
26 11 9	36 0 0	19 17 7	41 0 0	...	...	1 16 4	818 14 0	...	433 15 2
7 19 11	...	...	...	...	...	0 13 10	169 9 4	...	40 5 10
125 7 11	...	29 5 9	126 13 4	1 2 11	...	43 13 7	2,984 15 7	20 12 3	650 0 0
16 10 5	...	5 6 1	17 12 0	...	...	3 18 5	667 7 5	...	277 18 2
63 4 2	...	72 10 2	102 6 8	...	39 13 2	18 10 9	1,704 8 3	8 19 8	2,203 3 4
13 1 6	...	8 16 4	12 12 10	...	...	0 8 8	232 7 10	31 16 0	264 16 7
38 5 2	...	24 6 2	45 5 0	...	...	90 13 3	2,159 15 7	...	1,818 0 6
15 18 2	11 4 3	12 1 1	40 13 10	...	...	4 14 1	412 15 1	0 14 8	304 14 4
10 9 10	...	...	...	...	...	0 18 4	248 3 4	46 13 4	...
31 1 8	...	26 6 0	60 6 3	...	...	14 10 1	2,683 2 6	...	2,403 10 0
13 14 2	...	36 19 5	54 12 0	...	...	2 2 3	690 15 0	...	1,074 12 9
15 16 5	...	3 10 0	5 2 6	...	...	3 6 4	332 2 3	...	129 0 3
44 6 4	...	0 3 3	4 13 1	...	...	9 12 10	846 2 1	19 1 8	...
9 7 8	...	...	...	...	...	2 13 8	207 10 0	3 1 1	...
21 12 11	...	...	...	...	...	2 10 0	310 11 10	57 5 1	...
155 7 3	...	138 3 2	283 11 6	...	...	13 16 9	3,260 19 5	314 15 10	4,266 18 11
21 6 9	...	11 0 6	37 0 0	...	...	7 3 0	405 18 10	32 0 5	281 0 0
117 16 11	...	103 17 8	124 7 9	5 18 1	...	15 5 11	3,940 18 4	3 7 7	3,536 4 2
1,065 11 0	233 18 11	644 17 10	1,338 18 5	10 5 0	39 13 2	336 3 8	29,442 15 9	869 2 0	22,227 2 0

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
LANARK.									
Airdrie	3,710 9 7	...	297 6 8	8,171 19 9	5,968 15 0	149 17 3	261 13 4	447 8 3	338 11 6
Avondale	...	31 18 0	188 1 9	2,288 19 10	...	12 8 10	315 5 10	217 6 8	121 17 6
Biggar	299 16 8	...	25 0 0	1,112 18 8	...	1 11 8	44 18 3	61 1 5	76 5 4
Blantyre	...	...	171 14 3	4,607 16 9	...	38 4 2	322 6 3	274 15 3	300 17 5
Bothwell	3,469 11 7	105 19 0	347 1 2	17,771 7 7	5,077 15 2	49 13 5	837 19 0	1,180 11 9	74 15 7
Cadder	626 5 9	...	250 0 0	4,130 3 8	1,239 15 5	173 6 9	394 15 9	328 6 1	432 4 1
Calderhead	...	...	129 9 4	2,476 4 3	4 0 0	17 2 4	58 3 8	127 17 3	41 6 5
Allanton (Comb.)	...	...	12 7 0	278 5 5	...	1 3 10	1 19 11	12 4 5	...
Cambuslang	1,368 8 3	...	327 0 8	8,695 7 11	1,578 1 10	77 10 6	402 4 0	386 0 10	496 17 11
Cambusnethan	...	...	759 3 8	10,907 18 5	1,609 10 5	55 8 2	481 3 10	996 19 11	361 13 4
Carluke	831 9 10	...	112 2 8	4,218 18 4	...	28 11 10	292 14 6	164 3 3	186 7 11
Carmichael	29 10 9	...	8 0 0	177 10 0	...	2 5 6	0 19 5	8 6 1	8 11 6
Carmunnock	277 6 10	...	38 0 0	289 13 5	...	8 4 1	26 0 0	7 9 1	23 4 8
Carnwath	...	...	107 16 8	2,219 12 8	1,721 16 5	30 14 10	126 1 5	168 8 0	169 12 4
Carstairs	...	...	14 0 0	751 2 10	208 19 2	7 0 10	13 2 2	50 13 4	62 1 2
Clarkston	2,621 4 11	...	185 14 0	3,003 15 8	486 17 2	41 19 0	186 13 5	177 8 11	200 3 4
Covington and Thankerton	...	...	5 0 0	187 3 4	...	1 7 6	3 4 6	7 2 9	27 16 1
Crawford	27 5 10	...	15 0 0	492 0 0	...	3 5 10	3 1 5	16 15 6	22 14 11
Crawfordjohn	...	...	11 0 0	459 16 0	...	1 5 0	1 2 4	16 12 5	13 13 1
Culter	40 0 2	...	4 4 0	303 17 6	...	1 4 0	6 18 10	10 7 8	3 10 1
Dalserf	...	...	117 2 7	1,952 6 8	1,354 5 1	9 9 2	122 0 7	101 12 3	118 17 0
Dalziel	...	...	370 0 0	15,627 16 9	6,592 15 11	48 17 9	875 0 2	867 19 8	517 0 3
Dolphinton	...	...	11 0 0	209 5 0	...	0 5 0	0 13 7	2 14 11	...
Douglas	...	...	28 0 0	397 11 2	...	7 7 0	63 4 10	50 0 11	39 3 0
Douglas Water	3 2 5	...	21 0 0	574 18 8	...	4 17 5	39 3 1	42 6 4	15 18 8
Dunsyre	..	...	7 7 0	181 10 0	...	0 12 0	5 2 10	4 19 7	184 5 8
East Kilbride	55 0 9	...	113 4 0	1,329 4 7	6 5 5	16 12 5	83 19 11	72 9 7	149 12 1
Glasgow (B.)	...	...	12,567 6 0	221,830 10 6	63,622 19 9	2,017 15 10	10,803 4 5	14,780 19 1	13,051 11 11
Glassford	...	...	28 0 0	548 17 6	38 9 6	6 15 11	25 10 9	25 3 8	56 17 11
Govan	...	...	3,384 13 4	90,494 6 4	40,473 7 11	1,154 0 11	4,041 19 0	7,189 16 9	4,505 15 3
Hamilton (B.)	2,151 8 4	27 19 10	384 13 0	10,659 5 9	...	137 6 0	567 3 7	632 5 9	517 13 4
Hamilton (L.)	385 5 2	38 12 10	180 0 0	9,581 16 5	914 4 9	30 9 5	327 3 9	553 13 6	594 10 9
Lanark (B.)	...	...	63 15 0	2,684 1 0	...	21 3 7	247 7 3	143 19 11	232 8 0
Lanark (L.)	...	...	32 17 6	518 5 0	...	5 14 8	16 7 7	27 14 5	14 12 4
Larkhall	568 4 0	...	162 0 0	5,966 13 1	894 3 7	15 4 0	397 12 6	275 6 10	157 11 3
Leadhills	...	2 16 0	20 16 8	362 1 8	...	2 14 9	38 19 1	18 1 7	5 19 8
Lesmahagow	...	...	177 18 10	4,471 18 1	693 11 3	57 14 11	139 16 1	271 0 9	545 15 1
Libberton	30 10 1	...	...	209 10 0	...	2 19 4	...	8 0 7	67 8 4
Maryhill	...	...	963 17 0	15,951 17 4	3,703 11 4	146 8 4	899 2 6	1,645 11 10	521 1 8
New Monkland	..	...	191 0 0	2,398 2 10	...	66 12 7	73 19 1	157 14 0	172 1 9
Old Monkland	510 1 10	...	739 3 4	20,507 7 8	9,360 16 8	304 5 6	1,147 9 6	1,074 5 9	703 11 7
Pettinain	40 0 0	...	6 0 0	130 0 0	...	0 3 8	1 8 6	2 18 10	1 2 6
Rutherglen (including B.)	41 12 0	...	404 16 0	9,096 11 1	6,238 0 11	61 10 0	593 18 10	505 12 9	609 7 3
Shettleston	4,320 15 9	...	449 10 8	9,684 7 10	191 8 2	127 18 8	439 14 10	513 14 7	264 18 0
Millerston (Comb.)	703 14 4	...	20 0 0	505 11 8	...	3 3 9	26 4 3	28 9 6	31 15 10
Shotts	487 19 0	...	147 0 0	3,720 15 10	...	27 15 3	224 10 6	228 9 10	624 4 3
Springburn	696 0 4	17 18 1	189 15 0	4,269 9 5	1,211 13 5	14 3 1	185 9 10	317 7 8	185 17 1
Stonehouse	25 7 5	...	46 10 0	1,091 9 2	...	9 17 9	92 1 4	52 13 4	77 14 4
Sandford (Comb.)	...	...	15 0 0	104 7 6	...	0 0 3	2 17 3	9 0 1	9 15 11
Symington	11 14 4	...	7 2 0	189 5 8	...	0 11 0	3 16 8	7 14 3	39 7 3
Walston	120 17 5	2 7 8	7 0 0	200 0 0	80 0 0	2 3 7	5 7 9	5 18 2	182 7 10
Wandell and Lamington	84 9 11	...	5 5 0	143 0 0	...	0 15 7	2 7 6	3 1 3	0 14 2
Wiston and Roberton	...	...	12 0 0	231 14 0	...	3 10 4	3 8 9	11 19 3	3 10 3
Total of Lanark	23,537 13 3	227 11 5	23,882 14 0	508,968 10 2	153,271 4 3	5,011 4 0	25,276 13 11	34,292 16 0	27,864 14 11
LINLITHGOW.									
Abercorn	62 7 4	2 14 3	28 0 0	272 13 4	...	1 8 2	23 17 11	21 9 8	8 3 11
Bathgate (B.)	...	...	60 0 0	*	...	8 6 10	...	...	...
Bathgate (Comb.)	2,084 14 5	...	25 0 0	1,280 9 10	37 5 8	8 3 2	88 0 2	170 9 2	250 2 5
Bathgate (L.)	...	...	170 0 0	2,599 0 1	954 10 1	31 2 10	224 2 9	148 1 3	218 5 8

* No school under the Board.

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
568 14 7	...	874 10 6	1,233 9 8	13 14 6	...	121 6 6	22,157 17 1	1,941 19 7	33,127 14 1
200 1 9	48 5 0	442 0 9	536 18 8	...	...	14 14 1	4,417 17 11	...	13,318 13 11
88 8 0	...	99 3 10	133 12 0	...	...	98 15 10	2,041 11 8	...	3,159 0 0
423 8 6	...	372 2 7	566 10 0	4 18 6	...	149 5 4	7,231 19 0	122 13 9	11,045 0 0
1,136 19 1	...	1,845 6 5	2,505 2 4	17 10 7	...	327 14 0	35,447 6 8	...	61,065 4 0
309 4 4	454 19 10	555 10 5	693 16 5	...	...	35 13 8	9,624 1 5	367 4 3	17,463 2 7
209 6 3	87 7 6	364 6 10	453 11 8	19 6 8	...	10 19 3	3,999 1 5	362 8 7	11,373 16 3
26 4 0	37 19 3	19 0 2	17 6 8	...	...	0 3 3	407 13 11	2 7 1	...
858 9 11	...	730 10 2	928 1 9	7 2 9	...	282 0 5	16,137 16 11	916 9 7	19,921 6 1
874 7 3	63 4 2	725 13 0	1,159 12 11	24 2 1	...	232 17 11	18,251 15 1	131 2 0	20,991 7 9
308 5 5	...	214 14 7	576 0 8	2 16 11	...	75 19 11	7,012 5 10	...	6,259 10 9
10 8 0	...	14 4 4	16 13 4	...	...	1 3 6	277 12 5	47 6 4	425 0 0
35 9 2	124 9 3	52 10 2	71 7 4	...	...	7 17 5	961 11 5	...	1,590 19 10
126 0 6	...	157 10 6	223 0 0	...	...	19 11 2	5,070 4 6	236 16 8	4,591 0 0
52 17 0	...	139 3 4	92 13 4	...	...	1 8 3	1,393 1 5	...	3,704 13 9
201 19 10	...	162 11 4	286 3 5	17 5 7	...	146 16 0	7,718 12 7	...	7,625 5 1
12 12 5	...	12 10 5	17 13 4	...	...	7 16 5	282 6 9	...	357 1 6
26 18 3	...	18 1 2	28 10 0	...	...	2 4 6	655 17 5	...	614 18 7
26 0 1	...	20 6 11	138 10 0	...	...	...	688 5 10	167 0 4	502 10 0
16 12 5	...	...	...	...	...	0 18 11	387 13 7	9 4 5	...
173 3 5	...	151 0 0	265 6 8	...	...	26 19 6	4,392 2 11	149 4 3	5,690 3 4
1,478 11 3	...	1,455 12 10	2,306 10 10	41 17 8	...	291 6 9	30,473 9 10	2,462 9 10	48,253 14 4
8 14 7	...	0 11 3	15 4 6	...	...	...	248 8 10	259 11 10	...
77 9 4	...	61 19 10	72 13 4	...	...	3 11 0	1,401 0 5	29 3 5	1,853 0 0
40 12 0	...	111 15 2	98 4 10	...	...	2 2 6	954 1 1	102 3 5	3,389 4 8
11 0 0	...	23 12 4	26 13 4	...	...	2 4 6	447 7 3	...	743 0 5
113 7 1	...	72 14 6	267 0 0	...	...	16 16 3	2,296 6 7	...	2,358 11 6
20,593 15 1	...	43,653 5 2	39,486 10 0	672 15 9	4,180 10 1	10,613 3 7	457,874 7 2	30,777 9 8	1,239,464 5 6
35 15 3	...	36 18 1	50 0 0	...	...	0 2 4	852 10 11	73 5 11	999 0 0
8,437 8 1	...	13,987 8 11	13,890 10 0	128 4 2	...	551 15 9	188,239 6 5	15,086 13 11	425,278 0 0
772 2 9	...	851 5 8	1,398 8 5	23 12 8	287 5 10	322 3 4	18,732 14 3	70 8 6	21,592 12 2
959 19 8	14 10 3	1,028 7 7	1,364 8 7	2 9 6	...	206 5 9	16,181 17 11	321 1 11	29,758 5 4
215 0 7	...	160 1 0	308 15 9	...	...	5 8 9	4,082 0 10	8 16 7	4,486 19 9
46 1 5	...	21 4 11	71 5 3	...	...	1 13 11	755 17 0	82 4 6	526 10 0
389 2 9	...	403 3 1	749 15 9	0 15 0	...	53 10 0	10,033 1 10	...	12,528 6 7
40 11 1	...	74 17 3	124 0 0	...	...	1 1 8	691 19 5	60 15 11	2,202 0 0
251 12 10	...	212 0 10	482 8 0	2 11 0	...	87 9 3	7,393 16 11	...	5,994 13 8
12 5 0	...	...	...	...	...	0 19 11	331 13 3	...	36 7 9
1,399 11 8	...	2,327 16 8	2,165 5 6	11 18 0	...	398 2 5	30,134 4 3	...	74,132 0 3
188 6 5	79 0 10	92 4 8	400 0 0	16 9 6	...	18 1 7	3,853 13 3	282 14 11	2,525 0 0
1,627 1 8	...	1,612 7 8	1,821 17 8	32 9 10	...	620 12 3	40,061 10 11	...	56,112 14 2
5 2 0	...	...	...	...	...	1 11 4	188 6 10	0 13 2	...
922 3 7	...	1,324 16 8	1,504 0 0	14 8 6	...	265 9 8	21,582 7 3	...	41,223 6 8
767 19 4	456 4 7	1,402 16 9	1,444 8 0	26 10 8	...	299 17 1	20,390 4 11	...	45,412 15 0
43 16 11	...	...	...	...	...	44 13 5	1,407 9 8	...	510 12 2
287 7 2	60 0 0	265 7 1	494 3 4	...	...	13 0 0	6,580 12 3	...	8,275 1 11
401 5 4	135 17 2	452 15 8	609 4 0	...	...	153 2 10	8,839 18 11	...	16,198 3 9
81 6 2	48 5 1	57 5 11	135 6 8	...	...	15 9 3	1,733 6 5	...	1,757 5 10
21 4 4	...	...	...	...	...	3 7 3	165 12 7	...	...
10 11 4	...	19 15 3	18 11 5	...	...	0 5 1	308 14 3	...	555 1 10
6 1 9	...	18 3 0	29 3 4	...	...	6 13 0	666 3 6	...	742 7 2
9 5 6	...	...	...	...	...	3 17 7	252 17 1	...	28 11 1
18 8 10	...	25 2 1	30 0 0	...	...	1 4 6	340 18 0	37 8 10	750 0 0
44,958 10 11	1,610 2 11	76,724 7 3	79,308 8 8	1080 19 10	4,467 15 11	15,569 8 4	1,026,052 15 9	54,108 19 2	2,270,513 19 0
28 6 0	...	26 6 10	114 0 7	...	...	17 1 2	606 9 2	22 12 3	606 5 1
...	395 6 9	300 15 5	188 13 6	6 15 0	...	12 15 10	972 13 4	...	7,821 19 2
199 14 6	...	...	...	...	...	133 13 1	4,277 12 5	...	2,563 12 7
222 2 10	339 14 9	448 8 0	367 13 0	8 11 1	...	90 12 9	5,822 5 1	...	12,370 14 4

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s. d.	£ s. d.
LINLITHGOW—*contd.*									
Borrowstounness and Carriden	...	...	249 12 8	5,839 10 6	6,176 19 4	51 17 7	458 19 1	353 14 6	239 3 0
Dalmeny (incl. B. of Queensferry)	...	...	45 0 0	1,402 10 10	...	2 4 8	40 17 9	16 5 4	80 10 3
Ecclesmachen	5 13 11	...	21 0 0	174 6 11	...	3 0 5	17 19 9	7 4 9	153 18 10
Craigbinning (Comb.)	...	...	10 0 0	67 18 11	...	0 10 10	...	7 13 10	4 4 4
Kirkliston	...	20 16 0	69 15 0	1,992 2 1	63 5 11	9 9 6	94 0 2	99 7 11	109 16 0
Linlithgow (inc. B.)	1,037 19 3	...	130 19 9	2,376 6 6	...	34 16 7	109 3 3	126 6 3	139 2 5
Livingstone	85 18 2	...	48 0 0	1,094 2 3	...	4 9 8	31 2 2	56 15 4	119 17 4
Torphichen	130 17 10	...	53 0 0	1,525 3 8	...	13 0 4	46 2 1	68 13 5	119 18 1
Uphall	534 14 2	...	105 10 8	3,997 4 11	...	19 15 5	135 10 4	119 10 0	86 1 2
Whitburn	...	...	79 4 4	2,740 6 6	153 8 4	12 13 1	122 6 8	71 19 9	121 12 9
Tl. of Linlithgow,	3,942 5 1	23 10 3	1,095 2 5	25,361 16 4	7,385 9 4	200 19 1	1,387 2 1	1,267 11 2	1,650 16 2
NAIRN									
Ardclach	36 8 6	...	18 11 8	361 19 7	169 6 8	6 6 10	11 15 1	9 15 11	10 12 6
Auldearn	...	...	32 0 0	520 6 0	...	4 1 6	15 19 2	21 12 2	12 9 1
Cawdor	66 7 4	...	18 0 0	413 14 2	257 11 7	2 4 0	9 9 0	18 0 10	44 3 0
Nairn (B.)	94 6 7	...	63 10 0	1,594 6 8	...	13 8 8	26 8 2	45 0 9	34 16 6
Nairn (L.)	52 9 2	...	14 10 0	327 5 10	39 8 7	5 16 1	8 11 7	11 16 10	1 15 9
Total of Nairn	249 11 7	...	146 11 8	3,217 12 3	466 6 10	31 17 1	72 3 0	106 6 6	103 16 10
ORKNEY.									
Birsay & Harray	...	0 1 6	18 11 0	624 15 0	...	1 9 9	19 3 2	16 9 1	14 8 4
Cross and Burness and North Ronaldshay	...	11 11 6	34 15 0	376 15 0	...	8 19 9	13 16 10	18 0 9	97 13 5
Eday	48 1 10	...	16 0 0	237 1 10	...	2 3 0	24 2 4	14 18 9	32 11 0
Evie and Rendall	...	...	13 0 0	360 8 10	...	5 2 3	12 12 8	10 3 6	22 5 1
Firth and Stennis	15 17 7	...	15 0 0	485 6 8	...	2 14 9	28 17 9	16 18 2	12 0 1
Holm	...	4 17 4	10 0 0	259 10 0	...	1 5 7	12 7 0	11 18 2	13 5 2
Hoy & Græmsay	79 19 3	...	9 0 0	207 16 0	...	1 16 11	6 0 8	6 4 1	2 16 2
Kirkwall (B.)	...	...	10 0 0	*...	...	0 2 2	0 13 3	6 4 3	1 7 6
Kirkwall (Comb.)	432 16 3	...	60 0 0	1,785 17 1	...	11 18 10	78 7 4	103 16 4	39 12 5
Kirkwall (L.) and St. Ola	...	0 6 0	15 8 10	*...	...	1 10 6	...	...	...
Lady	63 8 11	5 5 0	8 0 0	477 6 8	...	0 15 0	13 4 10	8 17 3	52 8 4
Orphir	78 5 8	...	10 0 0	381 7 1	85 2 0	1 17 1	11 7 0	7 5 8	8 10 10
Rousay & Egilshay	67 9 4	4 7 3	21 0 0	397 9 2	...	3 14 6	17 0 5	14 11 7	17 5 4
St. Andrews and Deerness	186 3 3	...	25 0 0	537 7 5	...	3 10 5	26 0 8	12 17 11	89 12 11
Sandwick	...	...	13 5 0	360 3 4	...	1 9 7	33 5 4	10 3 7	5 12 6
Shapinsay	14 14 2	...	11 5 0	214 15 0	...	5 19 11	3 17 5	6 7 7	22 7 0
South Ronaldshay and Burray	121 14 1	...	48 0 0	1,089 16 6	...	8 8 2	50 1 7	27 18 10	83 11 10
Stromness	2,584 8 9	...	30 0 0	1,024 12 2	...	3 13 2	43 11 5	34 9 3	77 11 8
Stronsay	124 11 2	...	21 0 0	428 0 9	...	8 6 7	40 4 5	19 2 6	14 13 11
Walls and Flotta	94 5 4	...	20 0 0	553 18 5	...	1 18 7	16 4 11	20 17 3	26 4 7
Westray and Papa Westray	...	...	35 0 0	794 12 10	205 19 3	4 13 5	17 4 5	24 1 10	77 4 9
Total of Orkney	3,911 15 7	26 8 7	444 4 10	10,596 19 9	291 1 3	81 9 11	468 3 5	391 6 4	711 2 10
PEEBLES.									
Drumelzier	1 1 4	2 7 3	6 0 0	130 1 0	...	0 4 7	0 12 8	2 10 4	1 2 8
Eddleston	...	...	10 2 0	257 10 0	...	2 5 0	8 8 8	10 2 4	30 7 1
Innerleithen	...	...	57 17 6	1,626 0 5	...	11 3 0	97 12 7	68 18 3	232 2 4
Kilbucho, Broughton & Glenholm	...	...	14 0 0	300 0 0	25 0 0	2 15 1	5 17 7	4 11 1	12 5 7

* No school under the Board.

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
488 7 1	...	735 17 0	936 9 4	41 11 9	...	205 17 2	15,772 19 0	...	26,392 17 6
72 3 7	...	...	...	2 8 0	...	21 7 0	1,683 7 5	131 12 11	...
30 17 3	3 8 7	13 13 6	16 13 4	...	...	28 4 6	476 1 9	12 1 7	408 6 8
18 5 3	...	...	...	...	...	0 0 8	108 13 10	25 19 4	...
236 19 1	...	282 1 3	430 16 5	2 7 2	...	20 11 6	3,431 8 0	355 12 5	7,876 12 5
193 6 4	...	417 17 5	794 3 1	9 5 0	...	98 14 5	5,468 0 3	...	12,535 9 0
98 19 8	47 3 0	97 8 8	193 7 0	2 1 7	...	0 17 11	1,880 2 9	196 5 2	2,768 13 11
107 10 7	...	208 19 8	355 14 2	12 9 6	...	48 15 3	2,690 4 7	...	6,410 6 6
359 19 1	...	135 16 6	208 0 0	10 1 11	...	85 16 3	5,798 0 5	101 16 8	4,504 0 0
295 1 4	...	314 18 11	416 12 11	2 7 6	...	8 9 4	4,339 1 5	...	9,392 0 6
2,351 12 7	785 13 1	2,982 3 2	4,022 3 4	97 18 6	...	772 16 10	53,326 19 5	846 0 4	93,650 17 8
23 14 7	...	25 4 9	25 18 3	...	...	1 13 2	701 7 6	...	809 16 7
37 19 6	...	29 13 10	...	...	...	0 19 4	675 0 7	151 6 4	1,000 0 0
35 5 5	...	25 9 4	55 8 10	...	...	5 0 11	950 14 5	...	995 14 11
105 3 5	...	83 11 4	111 19 3	6 16 6	...	25 0 10	2,204 8 8	...	2,366 10 0
24 15 0	...	40 9 9	44 6 9	11 4 6	...	2 13 5	585 3 3	...	1,114 10 9
226 17 11	...	204 9 0	237 13 1	18 1 0	...	35 7 8	5,116 14 5	151 6 4	6,286 12 3
32 7 6	...	27 10 3	34 10 6	...	...	2 1 0	791 7 1	4 9 11	808 14 2
15 10 8	59 18 8	2 0 7	8 13 4	...	...	...	647 15 6	84 18 2	47 13 4
19 9 6	...	6 16 0	5 19 0	...	...	8 14 0	415 17 3	...	276 4 7
17 4 4	...	12 17 7	21 13 3	...	...	1 11 1	476 18 7	41 9 6	349 9 9
19 18 9	...	18 5 5	24 6 0	...	...	2 1 1	641 6 3	...	606 17 6
18 3 0	...	5 0 0	6 16 0	...	...	8 10 3	351 12 6	29 19 7	136 [illegible] 0
8 16 1	...	3 17 9	12 0 0	...	...	1 10 8	339 17 7	...	158 19 11
...	343 19 5	52 3 5	49 2 10	...	...	3 9 5	467 2 3	329 12 1	1,488 6 7
194 4 6	...	133 17 3	59 4 9	...	...	18 12 0	2,918 16 9	...	4,374 15 4
1									
...	82 13 0	...	...	...	...	...	99 18 4	97 9 10	...
15 14 2	...	1 5 0	5 6 8	...	...	2 0 7	653 12 5	...	43 7 1
22 19 9	...	...	...	...	...	7 0 8	613 15 9	...	140 15 9
20 8 6	...	8 6 6	8 14 6	...	...	6 10 1	586 17 2	...	342 6 1
41 1 5	...	12 9 5	13 5 10	...	...	8 0 9	955 10 0	...	635 5 1
17 19 11	7 10 0	6 17 5	12 10 0	...	...	...	468 16 8	167 19 4	216 5 0
16 16 7	...	5 3 11	6 6 8	...	...	2 19 7	310 12 10	67 1 8	155 3 4
66 19 9	...	35 4 6	38 4 0	...	...	4 15 10	1,574 15 1	...	1,105 17 11
68 4 5	...	51 4 1	58 3 3	21 8 6	...	157 2 11	4,154 9 7	...	3,976 10 11
25 17 3	...	20 11 9	20 6 4	...	...	5 16 5	728 11 1	...	580 14 8
34 19 10	...	11 3 2	15 11 8	...	...	4 5 8	799 9 5	...	380 6 11
43 16 8	...	27 1 10	28 7 8	...	...	15 15 7	1,273 18 3	...	861 7 2
701 2 7	494 1 1	441 15 10	429 2 3	21 8 6	...	260 17 7	19,271 0 4	823 0 1	16,685 1 1
4 2 0	...	4 9 9	9 0 0	...	...	0 8 1	161 19 8	28 15 10	121 10 0
11 15 2	...	21 3 11	21 5 0	...	...	3 1 7	376 0 9	59 19 7	690 12 6
122 1 0	...	76 0 10	141 10 0	1 4 0	...	19 0 9	2,453 10 8	...	2,537 9 0
12 12 1	...	0 9 4	13 6 8	...	...	...	390 17 5	17 17 1	...

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
PEEBLES—*contd.*									
Kirkurd	...	...	6 0 0	203 10 0	...	...	0 16 6	2 3 9	0 17 8
Lyne	...	...	8 0 0	129 10 0	...	0 7 6	0 7 0	3 19 10	2 11 3
Manor	...	...	6 0 0	150 0 0	...	0 6 3	6 14 8	2 17 0	0 12 0
Newlands	...	5 17 3	16 0 0	368 14 0	49 7 2	2 18 0	1 6 6	16 11 1	7 19 3
Peebles (incl. B.)	...	11 3 0	105 5 0	1,834 7 8	2,301 4 6	12 6 5	140 10 7	139 13 10	69 4 10
Skirling	...	7 7 0	6 0 0	194 13 4	...	0 5 0	3 2 6	2 1 0	22 16 10
Stobo	...	...	6 10 0	174 6 8	...	1 14 0	1 15 10	2 2 10	47 10 7
Traquair	...	...	14 0 0	208 10 0	...	1 2 0	4 2 5	2 2 9	17 13 4
Tweedsmuir	...	...	5 0 0	161 13 4	...	0 16 1	6 8 11	7 1 3	7 2 3
West Linton	142 14 11	9 0 6	21 13 6	400 6 8	...	4 15 6	17 15 11	20 11 4	14 2 1
Total of Peebles,	143 16 3	35 15 0	282 8 0	6,139 3 1	2,375 11 8	40 18 5	295 12 4	285 6 8	466 7 9
PERTH.									
Aberdalgie	...	...	12 2 0	80 0 0	...	0 19 7	3 11 6	1 6 6	2 8 2
Aberfoyle	...	...	28 0 0	479 9 0	2,542 4 1	13 7 8	24 10 6	14 4 9	114 19 11
Abernethy	...	...	23 10 0	433 11 11	...	4 10 9	8 0 0	11 1 3	10 11 0
Abernyte	...	...	8 0 0	223 10 0	555 4 9	4 16 10	1 1 8	9 13 6	0 19 0
Alyth	161 5 7	...	55 0 0	1,025 13 9	...	12 1 3	50 11 1	73 6 7	52 10 7
Amulree	...	...	12 0 0	182 7 10	1 1 0	3 17 7	5 19 4	15 8 9	19 11 0
Ardoch	...	...	20 0 6	417 14 1	...	3 1 6	4 6 6	16 11 1	3 7 6
Arngask	72 0 6	10 16 3	11 11 0	262 16 8	...	3 18 6	7 5 11	26 18 8	1 7 6
Auchterarder	250 13 0	...	40 0 0	1,186 0 9	88 9 0	13 6 7	76 11 5	41 18 0	38 18 1
Auchtergaven	80 9 3	...	19 10 0	421 5 2	...	4 1 6	16 19 7	10 1 3	19 11 6
Stanley (Comb.)	48 11 2	...	16 1 0	533 9 4	...	0 18 6	11 13 2	19 6 4	20 12 9
Balquhidder	...	5 3 0	17 10 0	256 3 0	...	4 14 0	9 11 2	9 9 8	78 6 6
Lochearnhead (Comb.)	...	...	10 0 0	202 3 9	...	3 9 0	1 5 1	6 2 8	3 16 3
Bendochy	...	...	17 0 0	128 10 0	...	1 2 4	7 5 2	2 0 0	5 15 2
Blackford	80 5 5	...	30 10 0	702 9 5	...	8 7 10	31 1 11	34 9 0	5 11 5
Blair-Athol	...	0 12 4	33 4 1	698 10 5	...	4 3 8	29 14 9	35 11 4	52 19 6
Blairgowrie	...	..	47 4 6	1,728 11 9	...	25 5 1	80 3 8	60 9 5	93 1 5
Callander	11 14 7	...	36 10 0	774 11 3	1,800 0 0	6 9 10	43 19 11	34 13 4	128 5 7
Caputh	...	...	21 15 3	450 0 1	...	3 18 0	9 6 0	4 14 0	28 17 3
Cargill	...	...	20 0 0	466 16 8	...	4 17 3	18 14 2	12 7 7	28 5 0
Clunie	...	4 7 6	14 10 0	247 10 0	...	1 2 6	5 1 11	4 8 6	2 18 2
Collace	97 12 1	...	17 10 0	234 3 4	...	0 12 0	5 3 5	4 0 9	16 10 2
Comrie	96 13 2	...	31 0 0	785 17 6	...	14 12 6	15 14 11	19 18 7	47 0 8
Coupar-Angus	657 2 8	...	28 0 0	1,096 16 6	...	4 1 1	25 4 11	55 11 0	22 19 1
Crieff	...	...	54 13 10	1,972 5 10	1,812 7 11	17 6 11	40 9 8	74 19 6	75 11 6
Dron	55 7 6	...	8 0 0	158 6 8	...	1 11 3	1 12 10	2 10 5	3 15 0
Dull	289 11 2	...	78 19 8	1,510 15 3	2,633 5 1	11 7 2	56 11 1	39 0 6	48 1 1
Dunbarney	...	...	12 10 0	350 3 10	...	1 11 1	21 19 9	8 0 2	6 6 3
Dunblane and Lecropt	363 13 7	...	57 0 0	1,484 17 4	...	11 7 2	49 8 6	66 18 4	122 5 2
Dunkeld and Dowally	645 3 1	...	30 0 0	643 16 4	...	2 7 11	16 1 5	14 1 5	24 6 1
Dunning	...	...	21 5 0	373 6 10	292 9 8	2 12 10	15 16 9	5 16 10	14 2 2
Errol	...	...	60 0 0	562 9 8	...	7 4 3	32 13 11	35 3 11	70 16 6
Findo-Gask	...	...	7 0 0	160 0 0	...	0 18 6	6 19 10	3 16 7	0 11 2
Forgandenny	...	...	10 0 0	258 12 0	...	3 6 10	6 14 4	2 8 2	5 6 0
Forteviot	13 2 5	...	11 15 6	344 6 0	...	4 3 0	16 14 8	8 18 11	2 18 8
Fortingall	...	...	17 0 0	211 16 7	...	2 5 11	6 11 2	11 11 0	4 14 2
Fowlis-Wester	...	...	15 0 0	340 8 4	57 8 4	2 9 6	15 15 7	16 7 6	82 19 11
Gartmore	...	13 10 8	16 3 10	298 8 10	...	7 4 0	19 3 1	4 11 2	12 9 9
Glendevon	4 6 2	...	6 0 0	133 10 0	...	1 19 7	4 18 5	4 17 1	6 2 10
Inchture	...	...	14 0 0	413 16 8	...	0 18 7	6 12 5	6 3 11	41 9 4
Innerwick (Glenlyon)	...	...	12 0 0	155 10 0	...	0 5 0	3 6 7	5 6 1	0 1 0

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
6 17 0	...	...	...	...	...	...	220 4 11	24 6 10	...
8 2 6	...	10 0 11	18 13 4	...	...	0 18 3	182 10 7	37 5 5	273 0 0
6 0 0	...	9 7 4	9 0 0	...	...	0 13 8	191 10 11	23 9 5	243 0 0
16 2 7	...	16 2 0	56 12 4	...	...	4 19 5	562 9 7	67 5 0	375 16 8
244 17 6	...	610 12 6	365 5 7	2 2 0	65 0 0	68 8 3	5,970 1 8	22 9 8	15,724 9 10
5 0 0	...	...	...	...	...	...	241 5 8	11 10 7	...
8 3 3	...	2 12 6	12 0 0	...	...	...	256 15 8	...	97 7 2
12 9 6	...	...	...	...	...	0 3 6	260 3 6	22 15 2	...
10 17 9	...	37 19 11	45 11 9	...	...	1 4 0	283 15 3	85 3 11	1,347 7 11
18 2 8	53 7 4	26 18 6	55 4 6	...	...	9 5 3	793 18 8	...	873 8 10
487 3 0	53 7 4	815 17 6	747 9 2	3 6 0	65 0 0	108 2 9	12,345 4 11	400 18 6	22,284 1 11
22 15 6	...	...	...	...	...	1 17 7	125 0 10	5 8 7	...
69 14 2	...	98 0 5	153 6 8	...	...	27 12 8	3,545 9 10	...	3,249 13 7
43 9 11	...	...	...	...	...	3 2 0	587 16 10	71 1 11	...
11 1 4	...	12 10 3	6 8 6	...	...	3 6 8	836 12 6	252 17 9	693 11 6
105 3 7	...	106 16 2	126 19 0	4 15 6	...	34 14 5	1,808 17 6	...	3,430 2 4
17 12 6	...	19 9 7	25 0 0	...	...	5 9 6	307 17 1	3 17 3	498 10 0
22 6 1	...	30 9 5	38 12 0	...	...	13 8 11	569 17 7	134 11 0	907 2 9
20 10 1	...	90 13 3	47 0 9	...	...	25 10 4	580 9 5	104 16 11	2,382 6 10
111 10 3	...	112 17 8	275 8 4	...	...	49 7 2	2,285 0 3	...	3,135 8 0
27 3 2	154 12 4	22 14 5	44 11 2	...	...	9 12 11	830 12 3	...	728 5 4
34 0 9	...	...	...	...	...	2 10 1	687 3 1	127 3 10	...
17 1 3	45 10 8	12 8 1	17 10 0	...	...	27 11 2	500 18 6	8 13 8	341 5 0
12 3 6	...	...	...	...	...	2 7 10	241 8 1	...	...
11 13 4	...	14 9 7	32 7 1	...	...	0 2 2	220 4 10	27 2 0	381 6 0
39 17 9	...	9 10 8	43 0 0	...	...	2 15 2	987 18 7	8 5 8	293 0 0
49 1 6	...	...	...	0 7 0	...	3 19 3	914 3 10	292 10 2	...
129 18 0	...	156 13 8	197 5 8	...	...	5 2 6	2,523 15 8	161 6 8	4,295 14 8
60 2 4	...	125 11 3	201 10 7	...	...	12 15 5	3,236 4 1	96 5 2	5,222 16 5
34 5 8	...	...	...	...	...	21 6 0	574 2 3	199 6 7	...
24 3 4	...	3 17 0	40 0 0	0 3 4	...	9 3 8	628 8 0	101 16 7	108 4 5
12 4 9	...	7 18 11	19 13 4	...	...	...	319 15 7	18 19 10	211 3 4
22 12 3	...	6 18 3	14 1 9	...	...	5 11 5	424 15 5	...	248 19 5
44 16 0	31 4 6	27 19 11	80 17 8	...	...	36 4 11	1,232 0 4	...	821 13 4
117 1 4	...	99 4 1	176 16 5	...	...	61 3 7	2,344 0 8	...	2,955 18 9
108 10 6	...	240 4 0	257 17 4	3 7 0	...	84 18 0	4,742 12 0	...	8,041 9 3
7 13 2	...	...	...	...	...	1 2 3	239 19 1	...	60 11 4
49 17 5	...	94 4 9	104 4 6	...	...	44 10 7	4,960 8 3	34 5 2	5,543 0 8
28 8 7	...	24 19 11	60 16 11	...	...	3 19 2	518 15 8	...	657 14 9
145 3 6	...	171 8 2	255 19 10	4 6 6	...	56 2 6	2,788 10 7	22 14 1	5,131 19 2
42 5 7	...	...	...	...	...	30 14 4	1,448 16 2	...	608 9 2
25 16 0	...	5 15 11	28 11 4	...	...	2 11 8	788 5 0	47 10 2	254 5 4
31 19 1	4 6 11	136 5 7	164 18 8	...	...	33 15 9	1,139 14 3	48 8 6	4,156 14 9
8 17 1	...	7 1 5	30 16 8	...	...	...	226 1 3	28 10 1	176 13 4
17 14 8	15 0 0	4 19 9	10 0 0	...	...	28 7 6	362 9 3	...	154 2 10
21 0 4	...	20 4 7	37 2 8	...	...	3 12 10	483 19 7	29 0 11	635 8 8
17 5 8	...	5 16 0	16 0 0	...	...	1 19 8	295 0 2	44 18 2	133 0 0
19 0 3	36 6 8	12 19 5	20 0 0	...	..	20 4 4	638 19 10	...	482 9 11
28 19 8	...	...	...	...	...	0 14 2	401 5 2	132 1 5	...
5 17 7	...	12 2 2	16 0 0	...	...	0 6 3	196 0 1	18 5 0	334 0 0
11 16 0	...	3 18 1	7 16 1	...	...	7 2 8	513 13 9	57 18 4	103 14 8
9 9 0	...	32 16 10	24 0 0	...	...	0 10 9	243 5 3	51 16 10	991 0 0

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
PERTH—*contd.*									
Kenmore	192 15 1	...	25 10 0	656 8 4	...	8 13 11	9 7 0	23 10 6	16 7 2
Killin	...	...	42 0 0	706 17 6	85 16 0	8 7 2	20 2 5	32 6 1	60 9 6
Kilmadock	...	...	40 0 0	928 10 3	...	7 15 10	31 3 0	96 2 3	23 3 1
Kilspindie	...	...	10 18 0	200 15 6	...	2 0 3	0 10 11	5 19 8	7 19 2
Kincardine	...	...	39 0 0	547 0 0	...	10 6 10	17 19 8	25 16 4	15 8 4
Kinclaven	...	...	10 0 0	181 13 0	47 0 0	4 11 10	6 18 2	1 10 8	15 3 10
Kinfauns	...	...	25 0 0	266 0 0	...	3 2 4	5 11 10	5 1 5	0 16 6
Kinloch-Rannoch	...	...	29 2 0	584 18 6	97 7 3	5 6 3	22 18 10	20 7 3	40 5 6
Kinnaird	...	...	7 15 0	211 10 9	...	1 2 0	0 11 9	5 5 8	7 0 0
Kinnoull	...	...	8 2 0	*...	...	0 5 10	...	...	...
Kirkmichael	...	...	12 0 0	439 16 5	5 14 0	2 10 6	26 19 8	22 3 6	7 6 3
Lethendy and Kinloch	...	...	8 3 0	170 0 0	...	0 7 6	1 8 10	1 15 10	...
Little Dunkeld	34 19 1	...	40 0 0	718 2 2	69 10 7	12 3 3	20 1 11	75 9 1	45 5 8
Logiealmond	...	2 12 6	10 0 0	323 9 8	...	2 7 7	7 3 11	9 7 2	15 11 4
Logierait	...	5 8 7	25 0 0	574 11 7	...	12 7 9	18 14 10	17 19 1	120 10 6
Longforgan	...	...	30 0 0	731 17 7	546 7 3	18 13 7	26 0 0	41 17 4	30 4 5
Maderty	5 7 0	...	13 0 0	173 10 0	...	1 0 0	3 16 0	2 6 1	1 0 0
Meigle	37 3 4	...	19 0 0	584 14 1	151 13 5	7 2 6	16 2 3	25 14 3	11 8 6
Methven	...	...	20 0 0	464 18 1	...	2 15 10	11 12 5	5 19 1	114 3 0
Moneydie	...	...	6 6 0	110 0 0	...	0 8 5	0 12 7	2 14 4	10 6 6
Monzievaird and Strowan	...	...	10 0 0	245 10 8	...	1 9 6	5 16 2	3 17 5	28 9 7
Moulin	...	6 5 3	80 10 0	1,175 16 2	...	18 5 8	35 19 0	65 7 4	59 19 0
Muckhart	...	...	12 10 6	182 5 10	...	1 5 4	5 1 10	3 1 3	16 19 4
Muthill	96 19 6	...	20 0 0	419 15 0	...	4 11 5	18 5 7	27 16 8	65 3 0
Persie	274 11 11	...	16 4 0	411 8 11	...	11 15 4	3 14 9	10 9 2	0 5 0
Perth (B.)	435 2 3	...	711 17 0	11,404 4 2	77 11 9	175 19 0	761 7 7	452 7 9	420 10 9
Perth, East Parish (L.)	...	...	13 0 0	143 19 10	...	3 13 2	5 19 6	13 13 10	1 11 0
Port of Monteith	4 6 6	...	12 18 6	247 10 0	...	5 16 9	3 8 8	23 18 6	16 16 1
Rattray	54 0 2	...	35 15 0	691 8 1	...	4 10 4	91 10 6	16 6 6	72 19 1
Redgorton	...	...	22 10 0	386 10 0	204 19 6	4 14 6	6 14 5	7 1 0	20 5 2
Rhynd	...	...	10 0 0	213 6 8	...	1 3 9	1 3 1	2 9 2	12 0 8
St. Madoes	...	...	22 0 0	292 3 11	...	3 9 9	0 14 8	2 12 3	11 17 0
St. Martins	28 12 10	...	17 10 0	480 4 2	...	6 4 10	4 11 2	15 1 11	32 6 10
Scone	...	...	20 0 0	750 4 4	...	4 17 1	44 1 4	34 15 9	56 12 11
Tenandry	...	3 13 7	8 0 0	*...	...	0 5 0	...	...	...
Tibbermore	162 6 6	...	26 0 0	464 10 0	...	0 16 9	5 7 7	6 4 7	7 18 9
Trinity-Gask	...	...	6 0 0	153 6 10	...	3 1 0	20 2 6	2 13 10	14 9 6
Trossachs	36 17 1	...	12 0 0	178 0 0	...	3 14 9	6 13 0	3 14 7	19 16 3
Weem	15 1 10	...	12 3 1	116 5 10	...	5 15 4	5 3 11	9 4 5	5 0 0
Total of Perth	4,305 14 5	52 9 8	2,491 9 9	48,971 16 2	11,068 9 7	599 13 3	2,087 18 11	1,956 4 10	2,726 8 11
RENFREW.									
Cathcart	...	...	698 13 4	11,900 9 2	9,688 3 7	391 12 0	803 18 9	1,143 14 4	1,569 15 10
Eaglesham	...	...	20 0 0	398 13 4	...	5 0 11	13 9 2	31 12 5	4 17 1
Eastwood	1,088 3 9	...	339 2 9	8,697 14 3	2,506 6 5	121 7 3	726 4 5	348 2 9	475 8 3
Erskine	...	...	49 1 9	668 12 3	...	16 6 11	15 5 0	43 12 2	126 18 2
Gourock	...	9 16 8	171 10 0	2,225 15 8	...	43 14 6	111 19 7	113 4 10	143 0 5
Greenock (B.)	1,084 9 4	...	887 19 0	21,244 15 8	70 4 1	292 14 1	684 19 7	1,526 9 10	889 3 0
Greenock, East Parish (L.)	...	6 11 6	63 9 0	884 12 6	...	14 2 6	37 8 9	86 1 9	72 16 11
Greenock, West Parish (L.)	...	5 2 9	20 10 0	*...	...	0 10 0	0 7 0	...	...

* No school under the Board.

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
43 19 1	...	30 4 4	41 4 3	...	...	9 16 5	1,057 16 1	...	977 16 0
51 9 5	...	62 11 1	130 2 3	...	..	19 3 6	1,219 4 11	176 11 3	1,659 3 10
83 4 8	...	32 4 3	59 15 0	...	...	35 9 11	1,337 8 3	54 0 2	921 19 6
8 10 6	...	4 14 4	10 13 3	...	...	0 1 8	252 3 8	16 10 1	126 16 0
14 0 0	...	8 17 11	3 3 4	...	...	7 7 2	693 19 7	39 13 7	236 16 8
14 14 3	56 17 11	6 0 8	8 0 0	...	...	0 9 1	352 19 5	19 19 5	155 0 0
18 0 3	10 3 3	34 2 6	40 0 0	...	...	1 7 5	409 5 4	70 5 6	1,020 0 0
18 12 10	...	72 19 1	38 4 4	...	...	21 10 6	951 12 4	...	2,057 8 2
9 0 0	...	...	...	...	...	...	242 5 2	18 12 1	...
...	50 16 8	17 3 2	15 2 4	...	...	...	91 10 0	12 17 3	475 2 8
26 14 0	...	8 9 2	31 14 6	...	...	21 3 9	604 11 9	70 14 10	217 17 10
7 10 4	...	...	...	...	...	2 0 0	191 5 6	14 15 10	...
57 2 0	...	15 7 9	59 2 3	...	...	21 10 10	1,168 14 7	...	400 1 3
17 4 4	...	31 8 7	42 10 0	...	...	14 4 6	475 19 7	200 2 3	791 13 4
37 14 3	...	45 8 7	70 0 0	...	...	6 15 7	934 10 9	25 0 6	1,240 0 0
40 10 2	20 10 0	16 18 3	18 6 8	14 0 5	...	50 11 9	1,585 17 5	532 9 9	718 6 8
15 9 8	...	...	...	...	...	1 10 0	216 18 9	3 9 0	...
47 18 10	...	69 5 1	69 10 0	...	...	19 2 11	1,058 15 2	...	2,049 15 5
38 9 6	32 10 0	...	...	2 16 6	...	9 6 0	702 10 5	...	77 13 10
8 5 0	...	16 6 4	26 13 4	...	...	0 19 4	182 11 10	16 11 0	573 6 8
8 6 6	...	...	...	...	...	0 1 0	303 10 10	65 6 6	...
91 7 5	...	190 3 7	198 17 10	4 2 5	...	18 18 1	1,945 11 9	...	5,824 10 10
16 10 10	...	6 7 0	14 14 6	...	...	10 18 2	269 14 1	91 7 8	166 15 9
43 4 7	...	6 10 8	44 11 10	...	...	14 10 6	761 8 9	...	170 7 2
21 8 0	22 11 9	11 3 11	31 11 7	...	...	18 0 1	833 4 5	...	446 17 3
1,328 7 0	...	1,377 12 0	2,367 6 8	32 10 7	766 15 3	1,121 8 6	21,433 0 3	...	44,150 9 7
11 2 3	...	...	...	...	...	1 14 6	194 14 1	45 6 5	...
29 7 5	...	8 19 8	13 6 8	...	...	1 5 9	367 14 0	87 18 7	246 13 4
52 7 7	32 9 0	21 15 5	77 2 2	2 4 10	...	18 13 8	1,171 2 4	...	691 14 4
26 17 6	46 12 10	9 5 1	15 11 2	...	...	5 8 7	756 9 9	...	286 11 7
6 6 5	...	...	...	...	...	0 8 7	246 18 4	...	63 16 6
9 8 10	...	17 11 9	30 0 0	...	...	1 6 7	391 4 9	38 3 5	480 0 0
23 12 0	...	65 10 5	67 8 10	...	...	1 8 6	742 11 6	...	1,855 10 6
59 1 2	...	78 5 8	122 10 7	...	...	26 8 11	1,196 17 9	151 18 4	2,455 16 1
...	...	...	...	...	...	...	11 18 7	4 19 0	...
29 7 3	...	...	...	...	...	7 16 1	710 7 6	...	32 10 0
9 13 4	...	1 0 0	12 0 0	...	...	...	222 7 0	30 14 10	24 0 0
20 1 2	...	37 7 2	41 13 4	...	...	1 8 2	361 5 6	...	1,008 3 6
3 12 3	...	38 15 10	17 9 4	...	...	6 9 7	235 1 5	66 17 4	1,153 15 2
3,988 13 0	559 12 6	4,073 8 5	6,277 19 4	68 14 1	766 15 3	2,190 3 4	92,185 11 5	3,983 16 10	130,126 4 2
917 19 3	201 0 1	2,355 10 11	2,511 14 7	0 10 0	...	202 19 9	32,391 1 7	3,596 15 10	74,741 18 8
39 11 2	9 5 2	66 18 4	84 0 0	...	...	2 14 1	676 1 8	163 0 11	2,096 0 0
652 4 2	...	1,099 16 4	1,033 1 0	12 12 5	...	173 4 11	17,273 8 7	696 16 7	33,028 15 5
53 11 11	...	21 12 10	65 4 7	...	...	4 3 9	1,064 9 4	328 1 11	683 2 7
159 18 8	...	55 3 0	258 7 7	4 4 1	...	32 15 8	3,329 10 8	120 12 7	1,424 0 0
1,666 7 8	...	2,463 14 10	2,374 3 11	49 1 2	650 15 6	855 4 10	34,740 2 8	4,289 15 5	70,455 11 9
51 5 8	...	60 3 1	131 19 0	...	...	15 19 4	1,424 10 0	141 10 5	1,602 19 0
...	30 0 0	...	...	...	...	...	56 9 9	1 4 5	...

General Abstract of Statements of Income, Expenditure, and Liabilit ies of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
RENFREW—*contd.*									
Houston and Killellan	...	...	42 3 0	370 6 6	...	8 1 6	6 14 7	13 19 0	58 0 2
Inchinnan	...	...	17 5 0	275 0 0	88 16 7	0 12 6	1 12 2	9 10 5	17 4 11
Inverkip	131 10 4	6 7 5	29 12 6	345 4 2	...	5 4 10	2 16 0	12 4 11	16 6 6
Kilbarchan	...	...	142 10 0	2,560 18 5	441 1 0	24 9 5	57 11 11	118 0 10	123 4 9
Kilmalcolm	...	...	77 12 0	1,128 14 7	...	18 5 7	74 1 10	68 3 5	180 4 1
Levern	...	19 10 4	55 0 0	557 5 6	...	8 10 5	17 4 10	22 16 2	37 11 2
Lochwinnoch	920 13 2	29 19 4	99 10 0	1,443 15 2	140 5 6	9 5 0	32 14 9	79 6 8	248 10 10
Mearns	132 18 0	...	55 0 0	911 1 0	...	13 17 3	69 6 2	33 8 2	220 1 8
Busby (Comb.)	314 5 5	...	40 0 0	958 11 4	...	3 7 9	31 10 8	83 16 1	26 7 5
Neilston	514 15 5	75 3 2	359 19 5	5,466 12 6	2 2 0	76 17 4	314 10 11	359 6 2	482 0 0
Paisley (B.)	7,828 7 4	...	1,003 15 8	24,575 16 3	...	328 2 9	578 0 7	1,904 12 4	1,338 0 6
Paisley (L.)	...	114 18 10	240 0 0	5,627 14 11	6,808 3 11	40 19 9	111 9 2	410 13 5	428 10 5
Port-Glasgow (B.)	...	...	265 0 0	5,443 9 11	...	127 6 1	331 10 7	564 2 8	249 8 5
Renfrew (B.)	118 9 1	10 3 8	158 7 4	2,930 8 2	565 8 0	21 9 6	134 2 10	69 3 11	25 6 6
Renfrew (L.)	...	13 2 2	115 0 0	5,597 9 6	212 2 7	138 17 11	210 15 4	323 2 0	307 0 0
Total of Renfrew,	12,133 11 10	290 15 10	4,951 0 8	104,213 0 9	20,522 13 8	1,710 15 9	4,367 14 9	7,370 4 3	7,039 17 0
ROSS AND CROMARTY.									
MAINLAND.									
Alness	117 1 7	...	30 0 0	415 6 10	...	2 13 9	10 13 0	11 17 3	25 10 3
Applecross	...	4 17 1	30 10 0	728 7 8	...	9 8 11	30 3 10	25 12 8	66 5 1
Avoch	...	10 0 0	29 0 0	590 6 10	...	6 0 0	11 19 4	22 4 1	13 2 2
Carnoch	...	2 2 0	17 0 0	113 8 5	...	0 11 0	1 7 4	2 19 7	9 2 0
Contin	...	...	24 0 0	266 0 0	...	0 11 1	5 18 0	7 6 2	2 5 4
Cromarty (incl. B.)	451 9 6	...	65 0 0	932 15 6	335 16 0	6 4 11	114 19 10	25 7 5	37 18 3
Dingwall (incl. B.)	...	...	98 0 0	1,776 18 4	415 12 6	13 3 3	50 8 11	54 18 3	116 12 11
Edderton	...	...	17 10 0	272 4 5	...	2 0 10	11 1 6	6 9 2	13 7 0
Fearn	180 5 11	...	26 0 0	822 0 0	10 10 0	1 12 7	44 18 7	21 3 3	3 3 10
Fodderty	94 11 4	...	45 13 0	566 18 8	...	2 0 8	15 19 2	13 1 10	7 18 1
Gairloch	43 4 5	...	54 1 7	1,526 10 1	...	18 8 2	113 18 3	64 0 9	91 2 1
Glenshiel	42 16 7	...	15 0 0	157 18 0	...	3 5 10	10 8 3	6 5 10	22 10 4
Killearnan	...	...	28 0 0	342 7 6	...	1 19 8	5 8 8	17 5 10	6 6 0
Kilmuir-Easter	245 6 0	3 6 0	22 2 0	484 12 4	...	6 0 4	46 16 10	16 4 0	6 10 3
Kiltearn	18 8 11	...	30 10 0	495 5 0	...	8 19 5	11 17 7	13 14 3	30 2 10
Kincardine	...	...	45 0 0	646 13 5	...	11 10 2	43 3 9	23 3 5	48 3 5
Kinlochluichart	...	...	34 0 0	281 13 3	...	7 13 3	11 5 10	18 18 10	130 1 2
Kintail	...	...	21 0 0	323 0 0	...	4 10 0	11 3 9	10 2 4	4 19 10
Knockbain	65 0 1	...	28 0 0	792 17 0	207 17 10	3 17 3	44 13 3	28 16 3	6 17 2
Lochalsh	142 11 2	...	32 10 0	887 9 6	55 16 3	13 0 6	40 14 5	35 0 3	63 17 11
Lochbroom	219 19 11	...	48 6 8	1,367 11 2	763 16 6	15 12 9	121 3 1	58 7 8	216 3 2
Lochcarron	...	...	40 0 0	778 8 8	...	7 4 5	18 2 0	34 8 8	70 5 4
Logie-Easter	...	...	26 0 0	399 2 0	228 17 2	3 16 6	21 17 4	15 6 0	23 13 11
Nigg	468 13 5	...	27 0 0	324 13 11	...	4 1 0	29 13 8	23 0 6	12 13 2
Resolis	5 17 11	...	32 0 0	398 12 6	...	4 9 0	18 18 11	12 0 10	37 11 9
Rosemarkie	155 18 9	...	29 0 0	915 16 4	8 3 8	6 5 0	35 17 10	38 17 8	6 13 11
Rosskeen	319 1 3	...	76 10 0	1,794 4 6	...	43 13 1	114 7 0	53 12 9	32 7 7
Tain (incl. B.)	171 9 3	...	59 0 0	802 17 7	...	7 14 8	19 17 9	59 17 1	47 4 3
Tarbat	31 18 6	4 4 0	24 12 0	601 9 0	528 8 10	1 3 3	12 10 8	17 7 4	0 19 8
Urquhart and Logie-Wester	...	...	69 0 9	844 9 10	...	7 5 1	18 12 1	29 10 3	86 3 8
Urray	14 14 8	...	46 2 0	668 6 1	...	3 15 6	29 5 5	35 15 6	89 14 1
INSULAR.									
Barvas	...	...	99 7 0	1,713 13 0	88 18 4	34 6 6	265 6 1	101 19 0	553 8 11
Lochs	...	23 10 0	108 13 0	1,539 18 3	...	23 7 0	200 19 1	113 8 7	328 13 2
Achmore (Comb.)	1 13 10	...	4 11 0	85 0 0	...	...	6 1 1	8 12 11	31 4 7
Stornoway	3,746 15 3	...	272 19 0	5,307 18 11	53 15 0	41 5 1	506 16 4	156 9 2	302 17 5
Uig	243 7 9	...	108 2 9	1,588 0 0	...	16 11 3	215 13 8	69 7 6	580 9 3
Total of Ross and Cromarty	6,780 6 0	47 19 1	1,764 0 9	31,552 9 6	2,697 12 1	344 1 8	2,272 2 1	1,252 12 10	3,175 19 9

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
27 19 4	54 0 0	85 19 1	82 10 10	...	...	0 19 7	750 13 7	165 3 11	2,373 3 10
12 6 6	...	4 7 6	12 8 0	...	...	...	439 3 7	127 9 6	115 15 6
16 12 6	...	12 4 1	15 0 0	...	...	6 15 9	599 19 0	...	452 7 4
177 16 2	58 6 2	259 19 9	364 19 1	...	...	59 4 6	4,388 2 0	1,020 2 10	8,402 9 2
132 6 2	175 0 0	164 17 0	114 19 10	...	...	37 10 2	2,171 14 8	88 5 10	4,315 5 0
72 19 11	198 6 3	37 18 11	45 12 9	...	...	17 3 2	1,089 19 5	198 19 1	1,345 9 1
175 15 6	...	310 6 2	353 1 6	...	...	58 8 4	3,901 11 11	...	9,886 7 1
91 19 1	348 4 7	93 14 3	164 19 3	0 8 6	...	24 12 11	2,159 10 10	...	2,015 3 6
126 10 9	...	...	...	...	...	43 9 11	1,627 19 4	...	312 15 5
523 19 4	10 0 0	798 17 6	1,225 1 7	2 7 9	...	195 12 0	10,407 5 1	193 14 11	24,315 14 10
2,317 4 3	...	3,917 17 7	3,433 16 1	60 12 2	679 4 8	380 4 10	48,345 15 0	...	119,251 1 1
568 2 7	...	687 14 7	884 18 2	28 5 7	...	131 17 8	16,083 9 0	1,489 12 0	24,629 4 1
524 0 7	...	519 7 8	719 11 4	13 13 9	...	149 5 11	8,906 16 11	191 5 6	14,341 15 8
178 18 9	...	64 6 11	162 13 4	...	...	44 10 10	4,483 8 10	18 3 7	1,748 0 0
585 1 11	...	1,414 4 5	703 12 9	4 15 0	...	261 3 4	9,886 6 11	548 0 10	39,964 2 0
9,072 11 10	1,084 2 3	14,494 14 9	14,741 15 2	176 10 5	1,330 0 2	2,698 1 3	206,197 10 4	13,378 16 1	437,495 1 0
31 17 7	...	21 4 0	44 13 1	...	...	13 17 2	724 14 6	8 6 0	577 7 9
43 11 3	...	11 0 6	30 0 0	...	...	2 9 2	982 6 2	139 3 4	285 0 0
30 5 7	...	25 13 2	54 6 9	...	...	7 16 11	800 14 10	72 6 4	696 4 6
4 0 0	...	...	...	...	...	2 4 6	152 14 10	57 10 1	...
10 15 0	...	11 11 2	11 13 8	2 16 7	...	0 1 2	342 18 2	58 11 9	318 12 1
47 11 9	...	64 5 10	80 7 1	...	...	24 6 8	2,186 2 9	...	2,430 3 1
148 5 5	...	86 8 9	153 6 8	4 4 9	...	24 0 4	2,942 0 1	...	2,918 12 10
17 8 5	...	1 0 6	15 5 9	...	...	7 2 8	363 10 3	31 6 11	14 0 9
38 16 11	...	54 11 5	56 10 11	...	...	16 13 5	1,276 6 10	...	1,707 4 5
47 7 7	...	15 11 9	29 2 7	...	...	16 15 8	855 0 4	22 16 9	420 0 7
69 14 0	19 5 4	134 2 3	147 0 6	...	...	29 6 8	2,310 14 1	103 4 11	3,696 0 4
7 8 8	...	10 5 0	17 10 1	...	...	13 19 2	307 7 9	...	331 8 5
16 14 9	...	9 14 7	12 10 0	...	...	0 8 4	440 15 4	74 10 8	265 9 9
32 14 3	...	30 0 1	28 15 7	...	...	12 8 0	934 15 8	25 6 5	828 9 5
31 1 6	...	10 5 8	38 6 8	...	...	15 17 7	704 9 5	21 5 9	324 13 4
38 17 3	...	29 15 1	41 0 0	...	...	2 11 5	929 17 11	210 15 10	811 0 0
20 12 3	...	0 8 11	12 15 1	...	...	0 2 5	517 11 0	172 6 6	...
11 1 9	...	...	...	...	...	14 12 8	400 10 4	88 13 9	...
32 1 2	...	32 16 8	50 14 7	...	...	1 8 0	1,294 19 3	...	921 6 6
36 4 11	28 17 9	71 18 0	78 10 11	...	...	31 5 0	1,517 16 7	...	1,982 1 4
101 6 1	...	77 14 10	75 0 0	1 3 9	...	54 2 8	3,120 8 3	188 7 9	2,485 5 9
41 2 9	...	26 16 7	61 0 0	4 4 5	...	9 14 10	1,091 7 8	...	793 1 1
23 7 3	...	26 14 2	33 19 0	...	...	13 4 8	815 18 0	...	813 9 0
16 16 10	...	29 19 9	29 7 5	...	...	14 0 2	979 19 10	...	1,389 0 8
24 19 1	...	21 15 3	20 17 3	...	...	0 13 10	627 16 4	...	611 8 10
42 19 11	...	100 4 2	140 0 6	...	...	17 16 11	1,497 14 8	53 17 11	2,860 18 9
106 9 6	...	149 4 6	162 3 0	1 14 0	...	118 3 9	2,971 10 11	...	4,282 8 7
55 3 11	...	38 15 2	43 19 2	...	...	17 14 7	1,323 13 5	43 17 10	879 1 3
23 10 0	...	36 11 1	38 8 9	...	...	1 18 7	1,323 1 8	...	1,280 1 8
54 2 8	...	18 9 7	96 10 5	...	...	25 0 0	1,249 4 4	125 6 7	431 10 4
35 15 0	...	1 7 8	20 7 4	3 0 6	...	7 2 10	955 6 7	...	43 13 2
41 18 0	...	58 12 2	67 5 9	18 16 0	...	34 3 0	3,077 13 9	...	1,337 15 0
27 0 0	25 0 0	135 11 6	154 1 6	5 18 0	...	22 7 10	2,708 2 11	2 0 1	3,393 9 1
2 10 0	...	...	...	...	...	1 6 7	141 0 0	2 10 0	...
337 19 8	...	512 13 11	733 15 4	13 5 6	...	384 4 3	12,370 14 10	2,253 18 5	15,146 13 8
29 19 0	20 0 0	101 11 9	260 0 2	4 0 0	...	61 9 5	3,298 12 6	...	1,445 9 11
1,681 9 8	93 3 1	1,956 15 5	2,839 5 6	59 3 6	...	1,020 10 10	57,537 11 9	3,756 3 7	55,721 1 10

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
ROXBURGH.									
Ancrum	45 15 8	...	18 0 0	420 5 7	...	10 13 1	23 6 0	15 7 1	60 18 8
Bedrule	...	...	2 0 0	120 0 0	...	1 2 0	1 0 0	2 14 4	21 12 8
Bowden	118 6 7	...	15 0 0	350 8 11	...	4 8 7	9 8 11	14 15 11	35 1 9
Castleton	229 15 1	...	33 0 0	1,019 0 3	...	13 16 1	30 3 5	25 4 7	83 17 0
Cavers & Kirktown	13 13 7	5 4 1	20 0 0	700 1 5	...	5 10 3	34 12 0	19 12 2	14 5 9
Crailing	9 15 10	...	13 4 0	222 0 0	...	0 9 7	2 14 10	8 3 0	13 18 5
Eckford	...	...	13 0 0	242 2 0	...	0 19 2	4 14 4	8 4 9	15 17 11
Edgerston	3 2 10	...	16 4 6	123 10 0	...	0 10 0	6 0 4	4 12 1	7 16 8
Ednam	23 8 0	...	7 7 0	352 11 6	111 2 5	0 14 2	16 9 0	6 10 9	42 4 10
Hawick (B.)	140 11 2	...	226 0 0	5,957 4 9	...	47 4 9	302 9 5	126 10 6	166 18 3
Hawick (L.)	...	...	31 0 0	605 0 0	...	1 15 0	6 0 5	9 3 2	30 7 1
Hobkirk	...	8 14 8	12 10 0	272 18 4	...	2 0 3	3 11 7	6 10 2	18 9 11
Hownam	...	...	5 0 0	125 0 0	...	1 1 2	2 7 5	3 18 3	5 6 6
Jedburgh (B.)	95 11 5	...	105 0 0	1,189 7 0	1,110 0 0	4 3 7	51 13 7	71 7 10	72 0 1
Jedburgh (L.)	...	...	28 0 0	280 10 0	...	1 6 0	6 18 6	8 12 5	40 19 11
Kelso	...	...	40 0 0	1,365 14 5	...	6 3 0	66 10 11	65 11 6	42 15 2
Lilliesleaf	..	12 1 2	14 0 0	261 18 4	60 12 2	3 6 8	13 12 11	18 2 5	58 2 6
Linton	...	...	8 10 0	190 0 0	...	0 7 6	2 0 7	1 19 3	7 8 1
Makerstoun	...	...	12 0 0	180 13 4	...	5 14 4	3 6 5	3 6 2	8 14 11
Maxton	...	...	10 10 0	186 0 0	...	2 0 6	4 16 5	3 8 3	19 0 1
Melrose	...	...	76 0 0	1,587 7 6	42 17 6	11 13 6	36 4 5	65 2 8	71 10 11
Minto	...	...	10 0 0	322 18 11	...	2 7 11	7 11 8	3 17 0	21 1 9
Morebattle	...	...	13 0 0	393 16 11	...	4 2 5	15 9 1	27 12 1	63 12 3
Oxnam	85 18 0	...	19 16 0	278 0 0	...	0 5 0	16 12 7	7 1 5	147 9 0
Roberton	...	..	15 19 0	280 10 7	...	3 15 7	2 5 10	3 5 4	4 8 7
Roxburgh	...	...	15 0 0	464 0 2	213 5 5	5 2 5	10 11 8	9 16 2	21 16 2
St. Boswells	46 6 3	...	13 10 0	215 0 0	...	2 11 0	9 11 11	10 13 7	58 14 3
Smailholm	8 4 4	...	11 0 0	220 4 7	...	1 5 0	9 11 3	3 14 6	26 4 11
Southdean	...	...	10 10 0	304 7 6	...	0 15 0	7 14 9	9 3 1	28 0 11
Sprouston	...	...	13 0 0	489 13 6	...	1 14 8	13 17 4	11 1 7	81 14 3
Teviothead	65 18 9	...	12 0 0	268 10 4	...	2 11 4	3 11 1	9 19 5	20 16 6
Yetholm	...	...	13 0 0	271 18 4	...	5 1 2	24 16 9	15 17 2	7 10 6
Tl. of Roxburgh,	886 7 6	25 19 11	853 0 6	19,260 14 2	1,537 17 6	154 10 8	749 15 4	600 18 7	1318 16 2
SELKIRK.									
Ashkirk	88 5 7	...	10 0 0	195 0 0	...	1 4 2	6 17 7	4 4 6	48 13 4
Caddonfoot	...	...	10 0 0	209 15 8	...	2 2 4	2 19 3	7 9 7	3 6 4
Ettrick	243 0 9	4 12 11	13 0 0	280 15 0	...	6 5 0	10 6 8	12 15 2	11 16 0
Galashiels (B.)	...	...	274 10 0	5,546 14 6	413 7 7	75 15 6	366 7 8	301 6 2	240 4 10
Galashiels (L.)	...	...	13 5 0	70 0 0	...	0 9 7	4 8 10	11 5 1	0 9 1
Kirkhope	...	...	15 0 0	319 16 8	...	3 18 8	8 1 0	7 10 4	8 15 6
Selkirk (B.)	52 0 0	..	112 0 0	1,802 12 2	...	9 3 9	93 13 8	120 14 8	234 5 9
Selkirk (L.)	22 13 5	...	21 0 0	508 11 2	...	3 8 2	31 0 9	21 1 2	24 14 9
Yarrow	167 6 5	...	20 0 0	438 19 11	...	3 8 9	16 18 4	9 5 10	31 4 5
Total of Selkirk,	573 6 2	4 12 11	488 15 0	9,372 5 1	413 7 7	105 15 11	540 13 9	495 12 6	603 10 0
SHETLAND.									
Bressay, &c.	42 0 6	3 19 9	15 0 0	210 5 8	...	3 15 8	6 11 0	9 9 3	5 13 2
Delting	...	7 7 7	34 0 0	450 14 6	...	6 0 3	7 16 10	20 2 3	24 15 2
Dunrossness	165 17 8	...	58 10 0	964 14 2	...	29 6 10	49 2 7	44 0 2	99 14 1
Fetlar	...	...	6 10 0	91 5 0	...	1 5 6	5 7 3	6 3 3	15 1 0
Lerwick	680 4 5	29 1 1	106 2 0	2,583 10 1	395 9 1	28 16 11	196 8 0	81 8 2	129 19 1

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
41 0 1	...	13 11 7	36 0 0	...	...	3 8 9	688 6 6	...	399 9 2
10 0 0	...	...	...	...	...	0 10 0	158 19 0	61 14 0	...
20 9 8	...	...	...	...	...	6 13 0	574 13 4	...	55 12 0
59 3 7	...	3 19 4	71 13 4	...	...	13 8 3	1,583 0 11	...	186 17 10
54 8 2	...	44 2 0	93 18 2	...	...	8 2 11	1,013 10 6	...	1,193 5 2
13 19 6	...	24 4 1	46 0 0	...	...	0 6 8	354 15 11	35 13 0	657 0 0
23 8 10	...	...	...	...	...	3 7 11	311 14 11	56 15 9	...
9 16 0	...	7 8 10	26 13 4	...	...	3 15 2	209 9 9	...	297 17 8
8 2 0	...	...	...	...	...	3 18 4	572 8 0	...	101 15 2
498 3 4	...	189 11 2	472 15 4	...	...	140 7 10	8,267 16 6	465 18 9	5,003 10 5
34 13 3	...	13 6 6	22 0 0	...	...	5 1 0	758 6 5	97 2 2	468 0 0
18 3 2	...	8 18 6	16 0 0	...	...	5 12 5	373 9 0	13 7 8	243 0 0
6 19 0	23 9 4	3 12 4	18 0 0	...	...	...	194 14 0	31 0 7	90 0 0
95 4 6	...	61 15 11	210 5 4	1 4 6	...	27 5 10	3,094 19 7	392 17 11	3,131 18 4
20 4 6	49 15 0	...	...	...	...	0 0 6	436 6 10	61 7 8	...
143 5 7	...	91 16 0	231 4 0	8 1 0	...	7 16 2	2,068 17 9	96 18 1	2,368 16 9
22 13 7	...	46 14 9	49 0 2	...	...	...	560 4 8	...	1,380 1 5
8 0 0	5 16 7	...	...	...	...	...	224 2 0	148 18 7	...
6 15 7	...	...	...	...	...	2 13 7	223 4 4	...	0 5 0
8 13 4	...	...	...	...	...	1 2 2	235 10 9	40 3 7	...
103 8 7	47 12 0	95 16 1	275 12 4	0 8 1	...	12 12 10	2,426 6 5	153 15 2	2,595 13 10
29 0 4	...	7 12 10	17 4 0	...	...	0 18 5	422 12 10	113 16 4	205 8 0
19 13 1	...	0 19 6	8 0 0	...	...	4 3 2	550 8 6	154 1 11	20 0 0
33 11 11	...	...	...	...	...	6 10 10	595 4 9	...	21 5 8
15 12 5	...	7 2 9	16 18 5	...	...	0 1 11	350 0 5	13 9 10	154 0 3
29 7 8	...	7 18 10	22 0 0	...	...	5 19 10	804 18 4	88 13 8	301 0 0
22 5 4	...	...	...	...	...	3 5 2	381 17 6	...	44 1 2
10 14 9	...	...	...	...	...	3 13 6	294 12 10	...	11 1 0
18 15 0	...	...	...	6 6 0	...	0 13 3	386 5 6	180 0 0	...
26 12 10	...	...	...	...	...	6 1 8	643 15 10	107 12 11	...
20 16 11	...	...	...	...	...	17 3 10	421 8 2	...	50 10 2
28 15 8	...	65 3 10	84 0 0	...	...	0 14 4	516 17 9	303 1 11	1,943 0 0
1,461 18 2	126 12 11	693 14 10	1,717 4 5	15 19 7	...	295 9 3	29,698 19 6	2,616 9 6	20,923 9 0
17 2 9	...	5 7 8	29 12 4	...	...	1 2 2	407 10 1	...	160 18 9
14 15 3	...	6 3 0	43 17 0	...	...	22 10 0	322 18 5	7 10 2	131 17 6
15 1 10	..	5 12 4	8 16 10	...	...	20 6 3	632 8 9	...	330 7 5
362 7 4	...	312 13 8	549 17 8	1 0 0	68 10 5	136 11 7	8,649 6 11	16,153 2 10	8,507 17 10
10 4 3	...	13 11 7	19 8 0	...	...	0 16 6	143 17 11	34 6 11	368 12 0
25 1 0	...	...	...	...	...	6 7 3	394 10 5	0 19 4	...
165 1 7	...	62 19 6	210 18 8	...	...	12 17 7	2,876 7 4	...	1,783 12 6
54 7 10	16 0 0	7 8 7	17 0 0	...	...	11 6 0	738 11 10	3 1 7	199 10 0
28 10 5	...	23 4 11	33 5 1	...	...	17 8 1	789 12 2	...	783 12 7
692 12 3	16 0 0	437 1 3	912 15 7	1 0 0	68 10 5	229 5 5	14,955 3 10	16,199 0 10	12,266 8 7
17 11 5	...	17 16 5	20 6 5	...	...	2 7 7	354 16 10	...	507 2 2
11 4 6	...	25 2 0	25 10 2	...	...	7 19 11	620 13 2	...	725 18 5
55 9 5	...	15 12 8	96 0 8	2 8 10	...	27 5 6	1,608 2 7	...	434 13 5
8 18 0	...	9 10 10	7 10 0	...	...	0 18 3	152 9 1	4 16 10	266 10 8
160 12 6	...	359 4 10	161 4 3	33 7 8	...	70 7 10	5,015 15 11	...	11,683 3 10

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
SHETLAND—*contd.*									
Nesting, Lunnasting, Whalsay, and Skerries	68 3 11	10 19 11	38 18 0	648 19 8	...	5 15 8	18 15 11	28 4 3	25 0 11
Northmavine	...	...	30 0 0	557 6 10	...	11 16 10	51 12 1	35 8 1	44 18 4
Sandsting and Aithsting	...	4 9 5	49 10 0	664 16 9	...	5 1 8	15 6 5	36 18 1	13 18 8
Tingwall, Whiteness, & Weisdale	...	5 2 0	58 0 0	694 15 3	...	10 17 3	49 19 11	34 0 2	16 12 6
Unst	15 14 5	4 0 3	52 10 0	376 6 0	...	7 14 10	9 19 7	20 0 3	57 18 11
Walls, Sandness, Papa, and Foula	...	4 9 6	28 16 6	531 13 0	72 2 3	14 17 6	12 7 3	39 17 8	65 7 8
Yell	2 15 11	...	49 5 0	749 4 8	...	12 12 2	44 18 10	61 8 1	58 9 9
Total of Shetland,	974 16 10	69 9 6	526 16 6	8,523 11 7	467 11 4	138 1 1	468 5 8	416 19 8	557 9 3
STIRLING.									
Airth	59 14 2	...	30 0 0	539 6 5	500 0 0	8 7 7	30 0 5	15 18 0	14 7 4
Baldernock	67 10 7	...	10 0 0	244 2 6	...	2 18 5	9 18 3	6 0 6	26 15 6
Balfron	176 19 8	...	22 10 0	413 13 4	...	10 7 1	4 11 9	9 11 3	19 19 1
Buchanan	157 7 4	...	22 2 0	312 8 6	...	8 17 6	14 10 3	3 19 8	63 14 2
Frenich (Comb.)	...	...	..	40 0 0	...	0 4 7	0 10 11	...	...
Campsie	540 6 3	..	110 0 0	1,322 8 3	...	16 10 8	157 15 4	119 11 8	49 7 7
Denny	2,238 5 1	29 15 6	108 15 6	3,300 8 1	336 4 10	28 11 3	318 0 1	168 1 6	270 13 5
Drymen	164 17 1	...	20 0 0	432 10 0	...	0 16 11	18 17 10	10 11 1	49 14 10
Finnich (Comb.)	62 17 10	...	7 10 0	70 0 0	...	1 13 7	3 9 3	2 12 7	14 4 3
Dunipace	123 1 2	...	50 4 0	717 13 7	...	8 19 11	72 4 3	24 6 7	22 12 9
Falkirk (B.)	4,955 6 0	...	450 14 4	14,303 17 2	4,184 8 5	88 16 2	1,111 5 11	837 1 4	1,400 17 7
Falkirk (L.)	1,198 0 7	...	218 0 0	4,711 14 7	...	47 18 8	379 13 7	238 13 5	429 14 11
Fintry	78 12 2	...	16 0 6	192 14 3	...	11 1 3	1 16 4	6 9 0	12 12 11
Gargunnock	...	...	20 0 0	265 1 10	...	15 10 5	17 10 3	4 19 0	17 11 3
Grangemouth	...	84 12 11	245 13 4	8,680 12 4	...	64 5 6	693 1 2	393 12 9	411 8 6
Killearn	101 5 2	...	18 10 0	320 0 0	...	8 18 10	10 9 0	4 1 2	34 14 11
Kilsyth (B.)	137 0 4	26 19 2	130 2 0	2,958 2 6	...	19 17 8	254 3 7	125 1 1	80 5 5
Kilsyth (L.)	605 18 6	22 12 4	40 0 0	1,092 18 5	699 9 8	9 4 11	15 10 7	39 11 10	10 13 10
Kippen	...	...	27 2 10	784 6 9	...	20 6 1	55 16 11	24 0 6	68 2 10
Larbert	1,626 12 3	52 11 2	200 0 0	6,728 9 8	...	27 4 5	531 5 8	326 12 10	246 12 6
Logie	147 9 4	...	65 5 0	1,111 9 3	...	13 15 11	79 7 3	63 17 6	91 3 9
Muiravonside	700 7 2	...	90 0 0	2,288 18 10	...	43 9 8	274 1 3	84 8 6	116 16 3
St. Ninians	...	...	170 0 0	3,751 8 3	4,248 7 10	60 3 0	154 14 10	216 19 9	200 4 7
Slamannan	...	...	130 0 0	1,847 2 0	100 0 0	33 19 2	120 7 4	80 19 4	105 4 2
Stirling (B.)	756 2 7	...	342 18 9	7,033 10 10	...	142 8 6	448 18 1	193 19 1	379 13 8
Strathblane	...	...	20 15 0	376 13 4	...	6 13 10	11 2 0	9 19 4	75 0 4
Total of Stirling,	13,897 12 3	216 11 1	2,566 3 3	64,339 10 8	10,068 10 9	701 11 6	4,789 2 1	3,010 19 3	4,211 16 4
SUTHERLAND.									
Assynt	54 3 5	8 6 9	54 11 0	902 5 4	...	13 4 3	46 9 10	35 19 11	19 17 3
Clyne	...	...	37 12 6	957 18 1	37 3 11	4 9 9	56 7 11	46 14 7	38 18 7
Creich	...	...	38 0 0	818 6 7	222 0 6	8 18 4	32 10 11	37 12 6	160 17 9
Dornoch (incl. B.)	...	...	42 0 0	1,204 19 8	54 9 0	5 0 3	53 18 2	25 15 9	55 14 3
Durness	...	5 19 1	39 3 0	607 17 3	...	5 11 7	44 1 6	17 15 6	18 0 6
Eddrachillis	82 12 10	...	50 15 0	772 15 2	215 13 0	8 8 6	59 11 4	22 2 11	81 2 2
Farr	...	...	62 11 0	1,183 10 10	96 17 10	6 13 1	64 1 6	51 8 1	49 13 4
Golspie	195 12 8	...	32 10 0	802 9 8	...	8 19 6	101 16 0	11 14 5	8 13 0
Kildonan	...	...	37 14 1	872 15 9	27 10 10	17 1 10	19 3 5	26 13 9	85 6 7
Lairg	30 16 3	...	26 0 0	506 10 5	...	4 4 3	63 14 10	27 11 4	18 5 5
Loth	...	...	20 0 0	115 0 0	...	0 15 8	8 5 3	9 10 6	6 2 11
Rogart	51 10 4	12 6 1	26 6 6	468 10 6	...	4 14 4	39 5 0	28 6 3	11 8 10
Tongue	100 14 8	...	32 0 0	826 6 1	3 2 9	4 19 4	39 5 10	26 14 0	254 10 4
Tl. of Sutherland,	515 10 2	26 11 11	499 3 1	10,039 5 4	656 17 10	93 0 8	628 11 6	367 19 6	574 10 11

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
52 10 8	...	35 5 10	35 14 3	...	...	3 11 5	971 15 5	...	971 13 6
23 17 1	...	20 1 7	19 2 9	...	...	5 1 8	799 5 3	38 0 9	554 11 9
17 4 3	..	36 3 3	43 3 6	...	...	50 6 6	936 18 6	50 15 8	1,122 18 4
60 5 11	...	42 19 8	50 6 7	...	...	2 2 9	1,025 2 0	120 3 1	1,182 15 6
24 1 4	...	25 18 2	21 13 10	11 11 0	...	1 15 11	629 4 6	...	756 2 11
21 6 10	...	37 16 2	37 14 10	...	...	4 15 4	871 4 6	19 11 3	1,025 0 9
45 17 10	...	61 14 10	58 2 1	10 0 2	...	1 13 8	1,156 3 0	...	1,716 2 6
498 19 9	...	687 6 3	576 9 4	57 7 8	...	178 6 4	14,141 10 9	233 7 7	20,946 13 9
60 19 6	...	...	...	...	...	43 6 10	1,301 11 3	...	297 3 0
14 15 5	...	29 16 3	34 2 6	...	...	2 3 5	448 3 4	...	864 17 7
24 6 6	...	40 2 1	43 8 10	...	...	22 0 11	787 10 6	...	1,166 19 2
25 5 10	29 1 5	...	...	...	...	25 1 11	662 8 7	16 11 0	...
6 10 0	...	...	...	...	...	0 7 10	47 13 4	...	...
237 8 8	...	307 5 6	334 17 11	...	...	58 14 5	3,754 6 3	...	9,112 11 7
241 12 11	66 17 3	419 2 11	533 16 2	1 5 7	...	127 14 0	8,189 4 1	...	13,560 0 2
30 7 5	88 17 7	19 6 1	55 9 5	...	...	16 17 8	908 5 11	31 11 4	454 19 1
15 4 7	...	3 17 1	8 11 6	...	...	4 4 7	194 5 3	...	194 1 2
58 0 10	...	78 15 3	149 9 8	2 11 0	...	13 6 1	1,321 5 1	...	2,159 5 4
1,309 7 10	...	1,882 10 9	2,115 3 5	49 11 0	...	451 15 5	33,140 14 4	...	58,216 8 2
397 4 6	...	582 3 6	856 1 8	6 13 6	...	246 4 5	9,312 3 4	1,102 2 0	15,849 0 8
13 3 5	...	11 14 2	43 16 4	...	...	6 7 0	394 7 4	...	321 1 9
15 7 0	...	0 10 7	15 3 6	...	...	1 4 0	372 17 10	39 2 2	10 0 0
602 1 0	...	795 16 11	1,042 7 9	19 1 11	...	199 2 10	13,231 16 11	642 10 1	22,263 3 3
34 15 0	21 11 1	10 12 2	66 17 10	...	...	9 2 3	640 17 5	...	380 0 3
261 6 3	...	433 8 8	378 4 8	3 7 0	...	81 17 6	4,889 15 10	...	13,068 6 5
34 1 7	...	104 6 10	120 2 2	...	...	27 18 2	2,882 8 10	199 1 10	4,459 19 9
64 5 0	...	46 9 4	153 1 0	...	...	20 5 0	1,263 16 3	39 19 10	1,182 0 5
502 17 8	...	770 14 1	1,117 16 8	7 17 0	...	162 12 6	12,301 6 5	...	23,250 7 0
114 15 1	...	69 9 8	142 0 0	5 16 3	...	18 13 10	1,923 2 10	48 10 0	2,082 0 0
153 2 7	15 16 4	172 5 8	314 9 4	2 13 0	...	82 11 0	4,338 19 7	...	5,332 12 5
250 17 9	...	484 5 10	728 11 2	...	...	43 7 6	10,309 0 6	1,615 2 11	18,987 0 4
168 9 7	...	52 14 11	174 14 11	1 13 0	...	10 16 1	2,826 0 6	392 7 11	1,332 19 6
581 13 4	...	330 14 6	651 16 5	17 11 7	333 4 10	208 18 11	11,421 11 1	203 2 7	9,221 10 3
33 5 7	...	...	...	...	...	6 10 2	539 19 7	62 2 3	...
5,310 15 10	222 3 8	6,646 2 9	9,080 2 10	118 0 10	333 4 10	1,891 4 3	127,403 12 2	4,392 3 11	203,766 7 3
48 19 4	...	119 7 10	79 12 10	...	...	1 5 6	1,384 3 3	82 2 6	3,287 4 3
58 9 3	...	112 7 1	145 12 10	...	...	1 18 5	1,497 12 11	...	3,306 1 5
39 3 8	...	67 13 10	105 7 3	...	...	2 7 2	1,532 18 6	76 15 8	2,202 10 9
60 13 1	...	35 12 3	28 2 9	0 17 0	...	25 3 5	1,592 5 7	96 4 6	996 6 9
44 4 0	...	17 10 4	36 6 0	...	...	0 3 4	831 12 1	155 12 1	478 13 0
65 15 9	...	43 4 6	45 0 0	...	...	6 4 5	1,453 5 7	...	1,151 15 4
58 0 1	...	92 18 4	114 13 11	6 8 8	...	67 15 1	1,854 11 9	538 15 6	2,489 7 5
43 15 4	...	44 5 0	65 12 6	...	...	25 15 4	1,341 3 5	...	1,481 4 0
62 18 2	...	46 9 9	89 19 5	0 12 7	...	4 3 7	1,290 9 9	50 12 7	1,206 18 1
46 1 6	...	38 7 9	46 13 6	...	...	2 0 2	810 5 5	40 3 2	969 3 3
15 5 2	...	14 11 10	20 0 0	...	...	...	209 11 4	16 18 5	402 0 0
29 3 6	...	18 2 6	18 0 0	...	...	10 1 7	717 15 5	...	453 11 6
55 15 10	...	68 17 6	76 6 0	...	...	12 9 9	1,252 2 1	100 4 11	1,920 12 6
608 4 8	...	719 8 6	871 7 0	7 18 3	...	159 7 9	15,767 17 1	1,157 9 4	20,345 8 3

General Abstract of Statements of Income, Expenditure, and Liabilities of

School Board and County.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
WIGTOWN.									
Glasserton	...	11 14 11	44 8 10	545 4 4	...	4 5 6	22 9 5	14 7 6	117 18 7
Inch	...	...	30 0 0	855 19 9	11 3 6	8 1 4	19 17 0	32 8 7	17 2 3
Kirkcolm	9 3 5	...	25 0 0	555 0 0	...	3 1 8	12 19 6	10 2 2	36 4 7
Kirkcowan	53 15 1	7 6 4	23 0 0	476 12 4	...	3 17 6	26 1 11	11 11 2	16 18 9
Kirkinner	209 12 5	4 1 9	27 0 0	607 0 0	...	2 18 0	9 5 4	20 9 8	16 8 11
Kirkmaiden	...	...	55 3 10	790 6 6	...	18 18 2	22 6 8	62 5 4	211 6 9
Leswalt	...	3 8 0	27 0 0	415 0 0	406 13 1	2 0 9	12 14 7	15 5 11	3 5 3
Mochrum	493 9 2	14 12 0	32 0 0	953 14 2	...	2 19 8	16 11 3	39 3 4	85 3 5
New Luce	27 17 6	...	14 1 0	295 3 4	...	0 17 6	5 8 5	4 14 8	45 4 1
Old Luce	204 13 10	...	39 5 0	884 3 2	...	7 8 6	18 4 11	26 7 9	91 7 4
Penninghame	178 13 2	5 2 2	37 0 0	1,134 17 2	62 16 6	12 13 9	76 19 2	78 2 10	22 15 11
Portpatrick	...	...	27 0 0	323 0 0	...	2 3 5	7 0 11	17 16 6	16 0 0
Sheuchan	...	4 0 6	7 4 0	*...	...	0 5 0	...	...	...
Sorbie	74 6 11	11 4 8	28 11 4	569 10 11	...	5 2 6	7 4 10	48 13 9	40 6 4
Stoneykirk	18 7 6	...	48 0 0	1,083 12 2	...	4 7 0	12 10 8	41 14 3	82 4 0
Stranraer (B.)	77 6 8	...	89 4 0	2,237 16 11	24 14 0	34 4 5	81 3 10	72 16 3	181 18 10
Whithorn	155 4 7	13 2 7	55 8 0	816 0 9	...	4 6 6	37 0 3	19 14 10	27 15 4
Wigtown	...	12 2 6	33 0 0	759 13 10	...	3 4 6	11 14 6	12 14 1	33 4 4
Total of Wigtown,	1,502 10 3	87 5 5	642 6 0	13,302 15 4	505 7 1	120 15 8	399 13 2	528 8 7	1,045 4 8
Total, Scotland.	170,895 14 9	2,807 0 10	78,868 11 0	1,795,495 16 9	468,717 3 4	18,409 1 9	91,829 17 9	99,696 4 10	103,757 13 7
Deduct Balances on 15th May 1906									
Net Expenditure									

* No School under the Board.

School Boards for the Year ended the 15th May 1907.—EXPENDITURE—*continued.*

Fuel, Light, and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
33 9 7	...	11 14 6	39 3 10	1 10 6	...	6 3 9	852 11 3	...	306 1 5
41 17 6	21 17 6	...	...	2 9 0	...	0 9 7	1,041 6 0	117 19 5	...
33 6 7	17 5 0	3 15 0	11 13 4	...	...	49 3 10	766 15 1	7 12 5	91 6 8
30 18 9	...	29 11 5	56 13 4	2 4 0	...	1 13 9	740 4 4	...	868 1 11
38 14 5	...	6 8 6	20 16 0	...	...	5 18 10	968 13 10	89 0 11	166 8 0
59 19 7	...	100 14 3	116 18 5	12 4 6	...	22 0 10	1,472 4 10	132 6 8	2,757 5 3
12 17 0	11 3 6	18 1 6	43 15 7	7 10 0	...	1 12 4	980 7 6	34 7 7	724 9 8
24 15 6	...	49 12 5	108 19 6	...	...	22 18 6	1,843 18 11	...	1,502 13 6
18 14 9	...	1 8 9	21 8 0	...	...	0 13 11	435 11 11	11 6 1	19 13 3
76 5 11	...	51 10 9	122 6 6	...	...	6 11 8	1,528 5 4	...	1,501 15 1
70 11 4	...	42 11 8	112 7 10	1 14 6	...	44 11 10	1,880 17 10	...	1,339 9 0
16 19 3	12 6 10	7 9 0	20 14 0	...	...	3 14 0	454 3 11	13 11 2	190 16 2
...	80 0 0	...	...	...	...	...	91 9 6	8 0 4	...
31 12 3	...	47 13 8	116 9 5	...	...	15 14 2	996 10 9	...	1,438 15 0
42 13 6	27 7 2	56 15 11	116 6 3	...	...	7 18 9	1,541 11 2	...	1,617 3 4
171 15 5	92 14 0	40 5 9	160 18 1	10 6 6	...	60 6 7	3,335 11 3	...	1,156 13 9
37 6 3	...	30 16 8	66 14 8	...	...	36 18 7	1,300 3 0	...	1,160 11 7
27 0 2	...	23 15 9	44 0 0	10 6 0	...	0 15 7	972 1 3	43 11 3	646 13 4
768 11 9	262 14 0	522 5 6	1,178 18 9	48 5 0	...	287 6 6	21,202 7 8	487 15 10	15,487 16 11
151,129 0 10	9,665 1 0	198,714 13 4	244,040 4 1	3,480 5 5	14,418 17 4	53,876 17 11	3,445,802 4 6	198,267 14 1	6,025,029 7 1
							170,895 14 9		
							3,274,906 9 9		

III. General Abstract of Statements of Income, ended the 15th May 1907. (Published under INCOME.

COUNTY.	Balance in hand on 15th May 1906.	School Fees and Books, &c., sold to Children.	Grants from Scotch Education Department.					Grants from County Councils, &c. for Technical Education under Local Taxation (Customs and Excise) Act, 1890.
			Grants in Relief of Fees.	(a) Annual Grants and Drawing Grants.	(b) Grants under General Aid Grant Minute.	Grants under Continuation Class Code.	Grants under Sec. 67, as amended and under Minute of 19th July, 1906.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Aberdeen	5,567 12 3	4,493 14 2	30,565 16 0	66,535 11 0	15,588 1 0	5,562 11 9	8,187 2 8	239 11 0
Argyll	7,925 1 7	548 6 8	6,257 7 0	18,110 10 11	3,980 7 4	809 5 2	1,658 3 0	405 19 7
Ayr	4,285 9 5	4,237 15 6	23,964 12 0	50,911 8 3	9,351 18 6	5,575 10 10	4,185 9 5	1,590 4 8
Banff	703 2 2	179 4 4	5,795 8 0	14,189 14 6	3,714 17 6	337 10 8	2,948 17 7	48 15 2
Berwick	789 0 5	105 14 8	2,672 18 0	5,909 19 3	2,413 10 0	107 5 10	140 1 3	...
Bute	147 18 1	329 3 7	1,378 16 0	3,152 7 9	747 14 6	151 7 10	92 6 1	30 0 0
Caithness	1,318 9 5	28 7 10	3,389 12 0	9,930 7 6	2,459 10 6	176 6 5	1,761 9 7	20 0 0
Clackmannan	412 13 9	704 4 7	3,039 18 0	6,495 13 8	1,173 13 0	1,010 15 9	1,741 0 5	235 7 2
Dumbarton	10,450 7 9	1,620 6 5	9,504 12 0	21,618 11 11	4,147 12 0	2,518 15 6	2,517 8 7	525 7 2
Dumfries	763 11 11	528 12 0	6,248 8 0	13,079 15 0	3,058 5 6	516 6 2	160 11 4	...
Edinburgh	25,447 7 4	2,873 1 8	34,956 6 0	78,460 15 8	13,945 11 9	8,175 14 1	2,590 17 7	259 4 5
Elgin	692 18 11	28 11 6	3,978 12 0	10,208 18 4	2,228 14 0	294 4 8	1,193 8 5	139 19 2
Fife	5,311 13 0	1,322 1 0	22,383 8 0	55,498 18 4	10,785 13 0	3,525 6 10	8,441 1 7	692 10 9
Forfar	1,220 18 5	5,381 7 11	21,969 4 0	48,899 6 9	10,280 10 0	3,937 19 5	5,973 8 9	139 6 11
Haddington	872 10 0	132 9 8	3,576 0 0	7,936 13 10	1,898 8 0	289 1 7	349 1 10	89 19 6
Inverness	1,652 16 1	107 5 3	7,510 15 0	19,438 13 8	5,310 6 9	324 8 4	3,395 17 6	83 0 0
Kincardine	748 6 6	52 1 1	2,613 12 0	5,069 0 2	1,742 19 6	226 14 7	212 13 10	...
Kinross	317 12 3	...	549 0 0	1,373 14 11	551 14 6	...	...	...
Kirkcudbright	475 19 6	43 12 0	3,480 12 0	7,275 1 10	2,353 13 0	231 13 6	260 16 9	200 0 0
Lanark	45,921 4 5	20,388 16 8	100,383 16 0	213,715 1 9	39,134 7 2	26,591 11 6	10,970 19 0	1,188 1 0
Linlithgow	1,966 10 3	172 10 6	5,533 12 0	11,669 12 4	2,510 14 6	355 9 11	1,313 8 1	8 5 11
Nairn	27 13 2	...	763 16 0	1,687 3 4	422 12 8	35 12 9	163 2 10	...
Orkney	717 15 1	10 8 5	2,123 8 0	6,179 3 1	1,736 5 6	41 6 5	732 18 4	...
Peebles	646 16 4	49 0 3	1,131 12 0	2,409 19 0	734 7 0	54 17 4	19 19 7	...
Perth	3,515 8 7	503 10 9	9,442 0 0	20,761 15 7	5,779 8 0	1,609 19 11	62 0 0	795 0
Renfrew	5,287 18 4	1,525 15 5	21,988 8 0	49,768 15 11	9,019 8 0	6,053 17 7	4,251 10 9	452 14 9
Ross and Cromarty	1,252 16 6	88 13 10	6,663 5 0	19,007 19 7	4,813 17 6	38 7 8	3,553 15 8	200 0 0
Roxburgh	1,230 0 11	157 1 3	3,736 8 0	8,254 1 8	2,851 8 0	492 18 7	601 6 9	...
Selkirk	416 4 11	157 5 3	1,741 4 0	3,706 2 1	853 12 6	625 7 6	667 0 11	20 0 0
Shetland	455 11 4	18 15 3	1,997 14 0	5,305 6 2	869 15 0	96 19 9	1260 9 10	...
Stirling	995 4 10	2,026 10 5	14,284 16 0	29,085 18 6	6,237 0 6	3,813 0 1	11,127 14 5	648 6 5
Sutherland	903 18 9	1 8 10	1,781 8 0	4,995 7 2	1,297 11 6	22 7 1	683 5 4	...
Wigtown	399 0 10	18 15 9	,727 12 0	5,313 1 0	1,637 17 0	213 18 11	116 16 1	44 4 11
Total	132,839 13 0	47,834 12 5	368,133 15 0	825,954 10 5	173,631 5 2	73,816 13 11	81,334 3 9	8,055 18 6

EXPENDITURE, and LIABILITIES of SCHOOL BOARDS for the Year

Section 51 of the Education (Scotland) Act, 1872.)

INCOME.

Grants from Committees for Secondary Education under Education and Local Taxation Account (Scotland) Act, 1892.	Amounts paid to the Treasurers by the Rating Authorities.	Rate of Assessment per £.	Loans Raised.	Endowments.	Contributions from School Boards under Sec. 42.	Income arising from other Sources.	Total Receipts.	Balance (overdrawn) on 15th May 1907.	Rateable value of School District.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
1,282 0 0	90,585 0 8	...	6,440 11 7	2,512 2 10	816 10 1	1,454 6 6	239,830 11 6	29,391 10 1	1,679,667
881 19 6	23,328 7 1	...	4,800 0 0	190 11 2	330 0 1	789 4 10	70,015 3 11	3,952 13 4	464,863
2,319 0 2	65,155 10 1	...	25,030 0 0	396 8 4	438 9 2	8,472 3 4	205,913 19 8	9,049 17 10	1,386,611
792 14 1	10,827 11 1	...	1,665 0 0	1,115 8 10	116 10 9	330 0 10	42,764 15 6	3,804 3 11	232,092
80 0 0	9,166 5 6	...	585 0 0	1 8 6	30 4 10	75 8 1	22,076 16 4	935 14 0	276,018
332 0 0	5,180 15 0	...	...	112 17 7	76 13 3	66 10 6	11,848 10 2	426 5 1	145,986
480 0 0	7,348 3 11	...	...	131 13 11	133 8 7	324 10 3	27,501 19 11	2,963 17 7	115,791
420 0 0	8,500 0 0	...	..	0 11 8	...	418 10 6	24,152 8 6	1,283 12 11	141,114
2,153 15 6	35,517 16 2	...	33,835 0 0	349 19 11	1,151 4 7	573 18 6	126,485 16 0	2,540 15 8	685,265
528 0 1	21,106 0 4	...	2,970 0 0	568 13 11	80 15 3	190 16 3	49,778 15 9	1,384 7 8	510,776
2,936 2 6	178,338 14 11	...	34,290 0 0	83 19 1	151 0 7	1,903 15 7	384,412 11 2	582 14 5	3,520,291
388 19 6	11,295 0 0	...	1,215 0 0	723 18 7	382 14 6	1,164 19 4	33,935 18 11	2,540 5 1	217,434
975 0 0	58,914 2 11	...	19,700 0 0	319 11 9	498 8 9	3,532 16 8	186,900 12 7	4,211 0 2	1,227,588
1,390 19 6	68,180 3 3	...	26,880 0 0	260 16 7	107 3 7	1,142 14 11	195,764 0 0	2,967 4 7	1,438,267
40 0 0	10,213 6 0	...	3,620 0 0	390 0 2	124 11 5	137 11 2	29,669 13 2	1,176 11 3	313,747
227 0 0	20,860 12 1	...	3,530 0 0	21 15 9	69 10 6	1,406 0 7	63,938 1 6	3,581 14 11	404,281
28 10 0	7,446 16 6	...	300 0 0	20 19 8	150 2 6	142 6 2	18,754 2 6	1,765 18 1	207,865
...	1,661 10 9	...	5,200 0 0	...	25 0 10	38 16 8	9,717 9 11	...	64,241
180 0 0	10,851 16 10	...	2,350 0 0	322 10 3	191 2 6	149 17 5	28,366 15 7	1,945 2 2	307,309
8,334 7 6	427,772 12 9	...	161,894 0 0	301 5 3	1,042 2 2	6,572 1 7	1,064,210 6 9	15,951 8 2	7,131,692
216 6 2	17,731 2 5	...	4,316 6 0	95 0 0	785 13 1	521 0 11	47,195 6 1	6,977 13 8	381,917
...	1,655 0 0	...	...	72 5 8	...	5 19 7	4,833 6 0	434 14 9	43,871
250 0 0	2,998 18 10	...	2,367 0 0	343 5 4	494 1 1	221 0 9	18,215 10 10	1,878 9 7	68,506
16 0 0	5,206 15 1	...	2,100 0 0	30 11 0	5 0 0	89 14 2	12,494 11 9	251 11 8	149,078
117 0 0	38,402 7 10	...	9,907 0 0	235 12 7	527 4 6	625 5 7	92,283 13 4	3,885 14 11	1,030,874
1,155 0 0	84,767 4 8	...	26,590 0 0	321 13 7	1,328 10 2	707 12 11	213,218 10 1	6,357 16 4	1,560,517
653 0 0	13,130 18 4	...	2,592 0 0	71 5 10	93 3 1	7,532 13 2	59,691 16 2	1,601 19 2	256,460
20 0 0	12,461 18 7	...	1,700 0 0	52 7 2	81 5 11	163 7 7	31,802 4 5	513 4 7	358,082
25 0 0	6,107 11 8	...	...	40 0 0	39 5 0	16,329 16 7	30,728 10 5	425 14 3	129,410
250 0 0	2,253 17 11	...	...	210 0 0	...	159 17 1	12,878 6 4	1,496 12 0	42,810
260 0 0	46,291 1 8	...	11,810 0 0	275 15 2	231 3 8	395 0 0	127,481 11 8	4,314 4 5	711,702
390 0 0	5,960 0 0	...	220 0 0	...	...	424 2 11	16,679 9 7	245 16 10	92,540
100 10 0	9,366 12 10	...	400 0 0	1 4 0	80 0 0	114 2 0	20,533 5 4	1,156 18 2	216,777
27,272 14 6	1,313,583 15 8	...	396,306 11 7	9,573 14 1	9,561 0 5	56,176 2 11	3,524,074 11 4	119,995 7 3	25,513,442

III.—General Abstract of Statements of Income, ended the 15th May 1907. (Published under

EXPENDITURE.

COUNTY.	Balance overdrawn on 15th May 1906.	Expenses incident to the Election of the Board.	Salaries of Officers of the Board.	Salaries of Teachers.	Purchase of Land, and Erection, Enlargement, or Alterations of School Buildings.	Printing, Postages, Advertising, and Other Charges.	Books, Apparatus, and Stationery.	Rent, Rates, Taxes, and Insurance.	Replacement of Furniture, and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Aberdeen .	13,425 13 1	665 12 7	5,086 2 0	138,064 14 1	26,176 13 9	1,154 17 3	6,806 19 2	7,320 3 11	7,339 10 9
Argyll . .	5,825 18 3	238 2 2	1,803 3 5	36,152 1 5	10,776 19 5	510 13 1	1,943 4 2	1,845 17 8	2,451 15 3
Ayr . .	18,767 17 10	94 3 1	3,989 3 0	105,649 6 3	21,040 10 2	1,002 9 5	6,684 4 0	4,787 18 8	6,048 15 2
Banff .	4,554 15 10	30 16 3	970 18 7	27,760 14 9	1,334 2 10	235 16 1	962 19 3	973 14 9	1,514 13 2
Berwick .	1,320 10 0	6 7 2	629 16 5	13,507 1 5	857 17 7	139 1 11	533 19 4	480 14 11	1,199 6 4
Bute . .	249 9 11	36 8 5	248 5 6	7,176 18 7	813 17 1	94 1 8	388 14 10	277 17 8	666 6 7
Caithness .	2,588 19 2	25 19 8	737 10 6	16,618 0 10	620 10 5	155 3 4	911 5 4	644 19 2	1,431 15 3
Clackmannan	552 17 5	51 1 7	460 8 4	14,984 4 3	576 19 0	151 18 11	1,466 3 8	723 10 9	1,013 2 4
Dumbarton .	4,577 12 6	22 3 6	2,224 9 2	49,556 19 9	37,330 12 8	501 5 8	2,634 5 8	2,543 4 7	3,403 16 2
Dumfries .	2,880 13 11	11 1 2	1,352 17 0	29,517 4 9	2,777 11 1	320 13 8	1,431 11 10	978 16 7	1,200 9 4
Edinburgh .	3,738 5 9	33 13 2	8,185 1 0	188,623 6 4	45,361 15 9	1,757 10 0	11,630 7 6	12,914 16 9	7,240 0 3
Elgin . .	4,506 5 0	96 7 0	757 6 1	18,226 3 4	2,273 10 4	204 8 8	564 13 8	884 9 0	1,047 3 2
Fife .	16,331 16 3	184 17 0	3,592 8 7	93,425 10 2	13,821 1 3	935 3 9	3,611 14 1	4,405 18 3	6,085 7 0
Forfar . .	9,841 19 8	26 18 6	4,039 0 7	107,666 2 4	16,174 12 9	956 14 4	4,624 17 10	5,194 9 5	5,703 15 11
Haddington .	1,585 19 2	15 18 2	782 8 6	15,524 5 2	3,660 17 2	122 4 10	394 4 5	726 11 3	580 2 5
Inverness .	3,359 4 0	85 2 2	1,956 12 9	36,889 3 9	6,198 8 1	496 12 7	2,049 12 2	1,760 19 8	1,946 10 0
Kincardine .	968 7 5	6 2 6	539 10 0	12,339 13 6	486 1 0	140 13 11	401 14 0	385 3 11	999 2 7
Kinross .	194 17 6	...	132 0 0	2,548 0 1	3,970 15 10	10 3 8	71 8 2	70 13 2	95 18 3
Kirkcudbright	2,269 14 11	41 6 2	747 13 2	17,406 15 10	2,736 6 5	184 14 4	914 6 8	432 18 1	1,039 12 2
Lanark . .	23,537 13 3	227 11 5	23,882 14 0	508,968 10 2	153,271 4 3	5,011 4 0	25,276 13 11	34,292 16 0	27,864 14 11
Linlithgow .	3,942 5 1	23 10 3	1,095 2 5	25,361 16 4	7,385 9 4	200 19 1	1,387 2 1	1,267 11 2	1,650 16 2
Nairn . .	249 11 7	...	146 11 8	3,217 12 3	466 6 10	31 17 1	72 3 0	106 6 6	103 16 10
Orkney . .	3,911 15 7	26 8 7	444 4 10	10,596 19 9	291 1 3	81 9 11	468 3 5	391 6 4	711 2 10
Peebles . .	143 16 3	35 15 0	282 8 0	6,139 3 1	2,375 11 8	40 18 5	295 12 4	285 6 8	466 7 9
Perth . .	4,305 14 5	52 9 8	2,491 9 9	48,971 16 2	11,068 9 7	599 13 3	2,087 18 11	1,956 4 10	2,726 8 11
Renfrew .	12,133 11 10	290 15 10	4,951 0 8	104,213 0 9	20,522 13 8	1,710 15 9	4,367 14 9	7,370 4 3	7,039 17 0
Ross and Cromarty	6,780 6 0	47 19 1	1,764 0 9	31,552 9 6	2,697 12 1	344 1 8	2,272 2 1	1,252 12 10	3,175 19 9
Roxburgh .	886 7 6	25 19 11	853 0 6	19,260 14 2	1,537 17 6	154 10 8	749 15 4	600 18 7	1,318 16 2
Selkirk . .	573 6 2	4 12 11	488 15 0	9,372 5 1	413 7 7	105 15 11	540 13 9	495 12 6	603 10 0
Shetland .	974 16 10	69 9 6	526 16 6	8,523 11 7	467 11 4	138 1 1	468 5 8	416 19 8	557 9 3
Stirling . .	13,897 12 3	216 11 1	2,566 3 3	64,339 10 8	10,068 10 9	701 11 6	4,789 2 1	3,010 19 3	4,211 16 4
Sutherland .	515 10 2	26 11 11	499 3 1	10,039 5 4	656 17 10	93 0 8	628 11 6	367 19 6	574 10 11
Wigtown .	1,502 10 3	87 5 5	642 6 0	13,302 15 4	505 7 1	120 15 8	399 13 2	528 8 7	1,045 4 8
Total .	170,895 14 9	2,807 0 10	78,868 11 0	1,795,495 16 9	408,717 3 4	18,409 1 9	91,829 17 9	99,096 4 10	103,757 13 7

EXPENDITURE, and LIABILITIES of SCHOOL BOARDS for the Year
Section 51 of the Education (Scotland) Act, 1872.)

EXPENDITURE.

Fuel, Light and Cleaning.	Contributions to School Boards under Sec. 42.	Interest on Loans.	Repayment of Loans.	Legal Expenses, and Expenses of Prosecutions.	Payments towards Maintenance of Higher Class School.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s. d.	£ s. d.	£ s. d
13,637 8 9	805 10 7	18,029 18 11	19,511 9 4	110 16 10	2,210 7 10	3,014 6 11	263,360 5 9	5,861 15 10	543,134 1 4
2,274 6 9	330 0 1	2,747 16 8	3,769 3 10	79 19 0	...	891 12 1	71,640 13 3	2,327 4 0	85,427 8 10
7,797 15 8	311 6 8	8,877 5 10	11,051 6 1	368 12 11	275 14 4	3,179 3 0	199,925 12 1	15,088 5 5	283,033 13 5
1,708 11 2	127 10 9	1,617 7 8	2,473 19 1	21 5 8	...	688 11 4	44,975 17 2	1,593 2 3	49,807 10 5
880 3 5	23 19 0	603 4 11	1,137 8 4	13 10 6	...	155 18 6	21,488 19 9	1,523 10 7	17,244 11 5
526 7 1	76 13 3	365 3 11	822 0 10	8 19 6	...	332 13 11	12,083 18 9	190 16 6	10,943 9 2
1,127 5 3	133 8 7	1,287 17 0	1,702 9 3	46 6 4	...	504 19 0	28,536 9 1	1,929 8 5	34,706 15 2
1,578 13 6	...	1,067 10 11	1,496 5 2	13 8 8	...	886 9 6	25,022 14 0	413 7 5	31,230 11 2
4,343 3 0	817 2 3	6,306 12 11	6,732 3 7	95 0 1	...	1,753 4 8	122,841 16 2	6,184 15 6	200,993 6 5
1,871 17 3	29 13 4	2,414 3 9	3,185 10 4	36 5 6	...	515 2 5	49,221 11 11	1,941 11 6	73,753 16 8
19,738 10 6	110 11 7	21,001 5 3	33,545 2 11	218 17 4	2,596 17 7	9,027 16 9	365,723 18 5	19,271 7 2	654,008 4 6
1,241 11 0	382 15 7	1,551 7 7	2,226 10 2	50 2 9	295 0 7	911 14 6	35,219 8 5	1,256 15 7	46,512 13 4
7,597 9 11	460 18 9	8,519 6 8	11,795 1 3	122 14 2	1,194 15 1	2,607 19 5	174,692 1 7	16,419 11 2	260,891 0 7
8,698 17 0	107 3 10	7,946 15 7	13,212 5 5	244 10 7	430 2 6	1,764 5 9	186,632 12 0	12,098 12 7	248,830 16 3
1,069 18 11	124 11 2	1,352 16 8	2,181 16 5	23 7 0	344 19 8	310 13 4	28,800 14 3	2,045 10 2	42,000 7 0
2,174 5 0	69 10 6	2,116 10 5	3,347 0 7	232 0 7	...	869 15 9	63,551 8 0	3,968 8 5	64,448 0 7
836 12 8	150 2 6	779 1 7	1,478 19 7	7 17 10	...	282 16 6	19,801 19 6	718 1 1	23,071 19 3
151 9 1	62 10 10	85 18 10	93 19 1	1 12 0	...	147 2 10	7,636 9 4	2,081 0 7	6,264 16 11
1,065 11 0	233 18 11	644 17 10	1,338 18 5	10 5 0	39 13 2	336 3 8	29,442 15 9	869 2 0	22,227 2 0
44,958 10 11	1,610 2 11	76,724 7 3	79,308 8 8	1,080 19 10	4,467 15 11	15,569 8 4	1,026,052 15 9	54,108 19 2	2,270,513 19 0
2,351 12 7	785 13 1	2,982 3 2	4,022 3 4	97 18 6	...	772 16 10	53,326 19 5	846 0 4	93,650 17 8
226 17 11	...	204 9 0	237 13 1	18 1 0	...	35 7 8	5,116 14 5	151 6 4	6,286 12 3
701 2 7	494 1 1	441 15 10	429 2 3	21 8 6	...	260 17 7	19,271 0 4	823 0 1	16,685 1 1
487 3 0	53 7 4	815 17 6	747 9 2	3 6 0	65 0 0	108 2 9	12,345 4 11	400 18 6	22,284 1 11
3,988 13 0	559 12 6	4,073 8 5	6,277 19 4	68 14 1	766 15 3	2,190 3 4	92,185 11 5	3,983 16 10	130,126 4 2
9,072 11 10	1,084 2 3	14,494 14 9	14,741 15 2	176 10 5	1,330 0 2	2,698 1 3	206,197 10 4	13,378 16 1	437,495 1 0
1,681 9 8	93 3 1	1,956 15 5	2,839 5 6	59 3 6	...	1,020 10 10	57,537 11 9	3,756 3 7	55,721 1 10
1,461 18 2	126 12 11	693 14 10	1,717 4 5	15 19 7	...	295 9 3	29,698 19 6	2,616 9 6	20,923 9 0
692 12 3	16 0 0	457 1 3	912 15 7	1 0 0	68 10 5	229 5 5	14,955 3 10	16,199 0 10	12,266 8 7
498 19 9	...	687 6 3	576 9 4	57 7 8	...	178 6 4	14,141 10 9	233 7 7	20,946 13 9
5,310 15 10	222 3 8	6,646 2 9	9,080 2 10	118 0 10	533 4 10	1,891 4 3	127,403 12 2	4,392 3 11	203,766 7 3
608 4 8	...	719 8 6	871 7 0	7 18 3	...	159 7 9	15,767 17 1	1,157 9 4	20,345 8 3
768 11 9	262 14 0	522 5 6	1,178 18 9	48 5 0	...	287 6 6	21,202 7 8	487 15 10	15,487 16 11
151,129 0 10	9,665 1 0	198,714 13 4	244,040 4 1	3,480 5 5	14,418 17 4	53,876 17 11	3,445,802 4 6	198,267 14 1	6,025,029 7 1

IV. GENERAL ABSTRACT of Statements of Income and Expenditure of

INCOME.

SCHOOL BOARDS.	Balance on 15th May 1906.	Contributions payable from Common Good of Burghs or other Funds under Section 46.	Endowments.	School Fees and Books sold.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1. Aberdeen	446 8 9	504 4 2	164 0 0	5,467 14 6
2. Arbroath	478 8 9	75 0 0	290 0 0	756 12 11
3. Ayr	...	95 0 0	57 14 1	1,975 12 0
4. Brechin	529 13 8	30 0 0	...	393 12 1
5. Callander	446 15 4	...	350 0 0	...
6. Dumfries	66 14 5	140 0 0	154 9 1	1,961 7 8
7. Dunfermline	1,374 7 9	130 16 8	...	1,076 14 9
8. Duns	465 4 1	...	...	277 0 1
9. Edinburgh	...	717 17 3	17 12 6	1,967 6 8
10. Elgin	770 4 7	130 12 6	26 6 10	515 2 6
11. Falkirk	...	...	100 0 0	429 16 1
12. Forfar	438 18 1	200 0 0	169 17 10	329 12 6
13. Galashiels	530 9 5	...	...	279 16 6
14. Glasgow	...	570 0 0	...	10,059 6 4
15. Greenock	1,572 4 4	145 0 0	43 8 4	2,051 12 6
16. Haddington	289 14 4	42 15 0	80 0 0	227 12 2
17. Hamilton	7 18 9	...	...	1,347 10 7
18. Hawick	...	...	...	...
19. Irvine	1,105 6 7	115 0 0	...	1,142 7 2
20. Kelso	113 2 10	...	...	415 7 0
21. Kirkcaldy	2,955 5 9	114 0 0	189 7 2	769 16 0
22. Kirkcudbright	...	224 9 2	200 0 0	220 3 6
23. Linlithgow	...	...	59 6 0	338 17 6
24. Montrose	93 8 7	180 0 0	67 1 5	999 11 6
25. North Berwick	536 1 6	...	...	139 16 0
26. Paisley	1,316 0 3	60 0 0	99 15 0	1,345 13 5
27. Peebles	20 7 7	100 0 0	...	161 16 6
28. Perth	...	271 14 0	161 12 6	2,687 10 6
29. Stirling	1,347 14 0	226 17 4	483 15 4	1,935 13 10
Total	14,904 9 4	4,073 6 1	2,714 6 1	*39,273 2 9
Deduct balances in hand on 15th May 1906	...	...	...	...
Net Income	...	...	...	...

* Consisting of school fees, £38,923 17s. 8d.; books, etc., sold, £349 5s. 1d.

Higher Class Public Schools for the Year ended the 15th May 1907.

INCOME.

	Grants from Committees for Secondary Education under Education and Local Taxation Accounts (Scotland) Act, 1892.	Grants under Minute of 27th April 1899.	Grants for Science and Art under Minute of 30th May 1903.	Payments out of the School Fund.	Loans raised.	Interest on Bank Deposits.	Income arising from other Sources.	Total Receipts.	Balance (overdrawn) at 15th May 1907.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1.	1,000 0 0	1,700 0 0	712 4 6	4,450 19 0	...	...	195 8 1	14,640 19 0	384 10 3
2.	300 0 0	750 0 0	389 4 2	856 2 11	...	...	...	3,895 8 9	...
3.	791 5 0	700 0 0	...	653 1 8	7,500 0 0	3 8 1	201 5 10	11,977 6 8	...
4.	300 0 0	550 0 0	196 15 6	380 0 0	...	1 2 10	26 2 6	2,407 6 7	...
5.	37 19 6	400 0 0	118 10 7	124 11 8	1,800 0 0	3 7 3	...	3,281 4 4	...
6.	611 4 9	850 0 0	244 13 4	803 7 6	...	...	16 18 0	4,848 14 9	55 2 10
7.	366 0 0	750 0 0	771 12 2	100 0 0	...	...	212 16 3	4,782 7 7	...
8.	1,000 0 0	400 0 0	84 3 6	...	...	...	15 11 0	2,241 18 8	...
9.	850 0 0	1,200 0 0	38 3 3	3,210 19 5	...	...	3 5 3	8,005 4 4	...
10.	285 0 0	600 0 0	167 12 3	466 6 4	...	0 19 8	45 7 6	3,007 12 2	...
11.	850 0 0	1,600 0 0	424 13 0	702 15 7	...	...	3 13 5	4,110 18 1	...
12.	300 0 0	1,150 0 0	506 19 11	154 10 3	2,900 0 0	0 9 2	...	6,150 7 9	...
13.	215 19 6	400 0 0	...	90 17 4	...	...	8 11 3	1,525 14 0	...
14.	2,480 0 0	2,800 0 0	77 9 3	7,908 7 1	...	...	14 6 6	23,909 9 2	...
15.	400 0 0	...	300 0 0	1,045 18 9	...	...	...	5,558 3 11	...
16.	100 0 0	400 0 0	100 5 6	315 7 5	...	...	8 14 6	1,564 8 11	...
17.	650 0 0	1,500 0 0	643 5 8	337 1 8	...	...	...	4,485 16 8	...
18.	...	...	...	...	...	...	2 2 0	2 2 0	1,187 7 11
19.	646 16 11	850 0 0	503 14 3	707 17 1	...	33 7 7	1 0 0	5,105 9 7	...
20.	583 0 0	400 0 0	12 8 0	90 17 4	...	...	5 13 9	1,620 8 11	40 5 1
21.	219 17 3	700 0 0	235 10	1,094 15 1	...	15 15 0	77 6 0	6,371 12 10	...
22.	325 3 10	800 0 0	107 1 10	53 8 11	...	0 9 3	...	1,930 16 6	...
23.	200 0 0	1,100 0 0	227 9 1	451 5 0	...	...	94 17 0	2,471 14 7	...
24.	360 0 0	1,600 0 0	676 4 3	535 6 2	...	4 5 1	186 0 0	4,701 17 0	...
25.	100 0 0	400 0 0	130 2 11	417 9 0	...	3 18 8	...	1,727 8 1	...
26.	1,100 0 0	750 0 0	433 18 7	1,493 11 10	...	55 3 7	...	6,654 2 8	...
27.	467 9 2	950 0 0	146 7 2	*476 5 8	...	6 19 9	149 14 7	2,479 0 5	...
28.	279 0 0	1,600 0 0	1,068 17 3	1,404 10 11	...	...	189 13 9	7,662 18 11	311 15 10
29.	750 0 0	850 0 0	614 15 5	456 1 0	...	9 10 2	309 0 0	6,983 7 1	...
	15,568 15 11	25,750 0 0	8,932 1 11	28,781 14 7	12,200 0 0	138 16 1	1,767 7 2	154,103 19 11	1,979 1 11
	...	...	...	...	...	...	...	14,904 9 4	...
	...	...	...	...	...	...	...	139,199 10 7	...

* Including portion of purchase price of additional playground, £140 16s. 1d.

IV.—GENERAL ABSTRACT of Statements of Income, Expenditure, and EXPENDITURE.

SCHOOL BOARDS.	Balance on 15th May 1906.	Salaries of Teachers.	Enlargement of School Buildings.	Books, Apparatus, and Stationery.	Fuel, Light, and Cleaning.	Replacement of Furniture and Repairs to Buildings and Furniture.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1. Aberdeen	...	9,692 4 4	758 13 0	292 9 4	333 6 5	510 12 11
2. Arbroath	...	1,924 5 0	...	65 17 3	83 18 11	161 4 6
3. Ayr	73 11 11	3,357 13 0	1,538 3 0	100 18 6	135 3 6	149 10 7
4. Brechin	...	1,428 19 2	...	111 1 5	51 3 1	148 2 0
5. Callander	...	863 16 6	920 3 1	71 9 10	57 12 8	26 13 11
6. Dumfries	...	3,543 14 8	...	83 16 10	165 6 8	112 7 11
7. Dunfermline	...	2,663 12 11	...	109 8 7	410 11 2	132 18 7
8. Duns	...	1,087 4 7	...	121 19 10	72 7 5	22 2 10
9. Edinburgh	...	5,955 3 6	...	108 12 4	285 6 9	206 3 7
10. Elgin	...	1,471 2 2	...	61 18 11	121 12 5	43 19 0
11. Falkirk	222 6 10	2,065 0 0	...	90 15 0	133 12 3	73 12 1
12. Forfar	...	1,562 12 2	683 11 6	148 16 4	74 3 6	10 15 3
13. Galashiels	...	707 7 6	...	36 2 9	34 4 0	18 19 9
14. Glasgow	...	15,606 4 7	...	256 8 3	733 2 7	2,424 3 9
15. Greenock	...	3,598 13 0	...	141 0 5	167 19 6	122 8 9
16. Haddington	...	1,005 8 4	...	78 15 0	90 19 5	32 8 10
17. Hamilton	...	3,334 18 4	283 17 0	108 9 7	357 10 10	131 6 7
18. Hawick	...	978 4 9	...	44 8 3	43 11 5	1 13 3
19. Irvine	...	2,009 18 10	...	74 10 9	148 1 10	297 6 7
20. Kelso	...	1,280 19 10	...	40 19 4	92 4 0	34 3 1
21. Kirkcaldy	...	1,917 8 10	2,255 19 11	266 9 5	214 7 3	361 11 7
22. Kirkcudbright	...	1,262 4 1	...	32 14 7	34 5 9	20 7 5
23. Linlithgow	21 0 0	1,270 6 6	...	126 6 1	131 3 5	28 12 8
24. Montrose	...	2,469 3 10	...	342 17 6	170 6 0	58 15 5
25. North Berwick	...	843 11 1	...	29 5 7	52 11 7	17 1 10
26. Paisley	...	3,651 3 10	...	39 14 1	370 9 2	54 14 9
27. Peebles	...	1,168 14 0	287 0 0	44 15 10	158 16 4	15 13 11
28. Perth	1,355 5 3	4,579 11 0	...	256 10 10	289 12 6	99 11 7
29. Stirling	...	3,316 15 9	446 12 6	170 15 1	245 7 3	183 9 11
Total	1,672 4 0	84,616 0 1	7,174 0 0	3,457 7 6	5,758 17 7	5,490 12 10
Deduct balances overdrawn on 15th May 1906	...	...	...	...	...	...
Net Expenditure	...	...	...	...	...	...

LIABILITIES of HIGHER CLASS PUBLIC SCHOOLS for the Year ended the 15th May 1907.

EXPENDITURE.

	Interest on Loans.	Repayment of Loans.	Rents, Rates, Taxes, and Insurance.	Expenses Incident to Annual Examination.	Printing, Postages, Advertising, &c.	Other Expenses.	Total Expenditure.	Balance in hand on 15th May 1907.	Liabilities on 15th May 1907.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1.	1,190 19 0	1,049 12 2	376 3 6	8 3 10	83 3 2	230 1 7	15,025 9 3	...	34,402 16 3
2.	307 7 6	369 5 5	135 14 2	18 5 6	18 12 11	159 8 10	3,244 0 0	651 8 9	8,663 7 11
3.	132 8 0	247 1 8	105 4 5	33 12 6	47 16 4	279 11 2	6,200 14 7	5,776 12 1	11,106 5 0
4.	95 18 2	93 0 0	30 10 0	7 2 11	5 1 0	54 15 0	2,025 12 9	381 13 10	2,743 17 8
5.	60 10 1	64 1 7	47 19 9	...	8 5 1	27 18 3	2,148 10 9	1,132 13 7	3,480 8 7
6.	447 7 6	356 0 0	86 8 6	8 15 4	37 2 0	62 18 2	4,903 17 7	...	14,197 2 10
7.	...	...	80 19 6	4 18 0	30 2 8	161 19 2	3,594 10 7	1,187 17 0	...
8.	...	...	25 0 11	0 10 0	30 1 9	349 3 4	1,708 10 8	533 8 0	...
9.	220 9 4	393 12 6	319 6 6	1 14 0	105 15 11	408 19 11	8,005 4 4	...	6,602 14 3
10.	139 4 3	168 2 4	89 13 6	...	15 16 9	64 16 10	2,176 6 2	831 6 0	4,624 15 11
11.	403 17 7	298 18 0	97 5 10	0 10 0	9 19 3	22 14 3	3,418 11 1	692 7 0	12,130 6 0
12.	43 15 0	110 0 0	14 3 11	3 13 5	13 13 0	37 4 3	2,692 8 4	3,457 19 5	4,325 0 0
13.	4 11 7	17 15 4	17 19 1	...	12 18 1	3 9 3	853 7 4	672 6 8	124 6 8
14.	1,837 17 0	1,890 0 0	895 7 2	16 19 2	189 9 11	59 16 9	23,909 9 2	...	51,670 0 0
15.	194 7 0	200 16 3	151 4 3	...	56 5 1	208 10 6	4,841 4 9	716 19 2	4,681 17 10
16.	66 8 3	61 3 3	52 3 7	...	22 9 10	56 19 5	1,466 15 11	97 13 0	1,727 4 5
17.	16 9 2	33 6 8	92 14 3	3 9 0	48 11 4	67 5 2	4,477 17 11	7 18 9	1,383 6 8
18.	...	...	54 13 4	...	11 4 10	55 14 1	1,189 9 11	...	1,187 7 11
19.	447 18 11	257 15 10	55 18 1	9 5 0	23 19 2	135 19 5	3,460 14 5	1,644 15 2	13,657 11 8
20.	36 11 4	54 6 0	39 9 9	...	16 16 2	65 4 6	1,660 14 0	...	1,044 6 1
21.	...	...	148 4 4	...	24 0 11	158 15 1	5,346 17 4	1,024 15 6	...
22.	49 15 9	64 0 0	10 7 6	...	3 7 0	33 13 0	1,510 15 1	420 1 5	1,484 0 0
23.	243 8 9	472 16 3	62 12 9	...	21 19 8	35 4 5	2,413 10 6	58 4 1	6,556 8 8
24.	212 17 5	263 18 4	80 1 9	...	50 4 10	127 19 1	3,775 19 2	925 17 10	6,345 13
25.	115 15 3	144 10 0	26 15 5	...	4 16 6	31 1 8	1,265 8 11	461 19 2	3,418 0 0
26.	460 0 2	354 7 0	191 8 9	18 6 2	22 11 9	27 16 8	5,190 12 4	1,463 10 4	13,631 6 0
27.	149 14 5	120 15 2	36 5 6	...	7 17 0	7 4 1	1,996 16 3	482 4 2	4,187 3 7
28.	221 15 8	416 0 0	158 16 3	11 11 6	61 6 4	524 13 10	7,974 14 9	...	7,240 13 3
29.	83 9 7	147 13 3	78 9 2	3 4 10	26 10 0	168 1 1	4,870 6 5	2,113 0 8	2,337 19 5
	7,182 16 8	7,648 12 0	3,561 1 5	150 1 2	1,009 18 3	3,626 18 9	131,348 10 3	24,734 11 7	222,953 19 11
	...	...	...	...	...	...	1,672 4 0	...	...
	...	...	...	...	...	...	129,676 6 3	...	...

V. LIST OF PAYMENTS by TOWN COUNCILS from Common Good of Burghs, or other Funds, under Section 46.

1st, To Public Schools.

Annan	£99	4	0
Anstruther Easter	10	0	0
Banff	110	0	0
Burntisland	38	10	0
Campbeltown	20	0	0
Crail	21	0	0
Culross	17	3	11
Dumbarton	100	0	0
Dunbar	80	0	0
Dysart	50	0	0
Forres	110	0	0
Lanark	40	0	0
Musselburgh	51	10	0
Pittenweem	35	0	0
Port-Glasgow	35	0	0
Renfrew	223	11	0
Ruthergien	40	0	0
Selkirk	40	0	0
Stirling	24	14	6
Total	£1,145	13	5

2nd, To Higher-Class Schools.

Aberdeen	£504	4	2
Arbroath	75	0	0
Ayr	95	0	0
Brechin	30	0	0
Dumfries	140	0	0
Dunfermline	130	16	8
Edinburgh	717	17	3
Elgin	130	12	6
Forfar	200	0	0
Glasgow	570	0	0
Greenock	145	0	0
Haddington	42	15	0
Irvine	115	0	0
Kirkcaldy	114	0	0
Kirkcudbright	224	9	2
Montrose	180	0	0
Paisley	60	0	0
Peebles	100	0	0
Perth	271	14	0
Stirling	226	17	4
Total	£4,073	6	1

EDUCATION (SCOTLAND).

NORTHERN AND HIGHLAND DIVISIONS.

GENERAL REPORT FOR THE YEAR 1907,

BY

G. DUNN, Esq., M.A., LL.D.,

ONE OF HIS MAJESTY'S CHIEF INSPECTORS.

Presented to both Houses of Parliament by Command of His Majesty.

LONDON:
PRINTED FOR HIS MAJESTY'S STATIONERY OFFICE,
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1908.

[Cd. 4033.]

NORTHERN AND HIGHLAND DIVISIONS.

Comprising the Counties of Aberdeen, Banff, Caithness, Elgin, Forfar, Inverness (part of), Kincardine, Nairn, Orkney, Perth (part of), Ross, Shetland and Sutherland.

Population - - 1,025,337.

Inspectorial Staff.

2 Chief Inspectors.

6 Inspectors.

2 Junior Inspectors.

3 Sub-Inspectors, 1st Class.

7 Sub-Inspectors, 2nd Class.

GENERAL REPORT *for the year* 1907 *by* G. DUNN, ESQ., M.A., LL.D., *one of His Majesty's Chief Inspectors, on the* SCHOOLS *in the* NORTHERN AND HIGHLAND DIVISIONS OF SCOTLAND.

Aberdeen, 31st December, 1907.

MY LORDS,—

I have the honour to submit my Report on the Schools in the Northern and Highland Divisions of Scotland.

The inspectoral staff for the Northern Division has remained unaltered since the date of my former Report. Though the separate organisation of the Highland Division has been operative during the past session your Lordships have deemed it desirable for this year to include the work of that division within the general scope of this Report; and I am greatly indebted to His Majesty's Chief Inspector Mr. Robertson and his colleagues for their valuable co-operation.

As the new Regulations for the Training of Teachers have imposed upon me a large amount of work both directly and indirectly, it has been impossible for me to make myself acquainted with the work of the Primary Schools in the Northern Division except very casually and intermittently; but my colleagues have supplied me with information which to a large extent meets the requirements of the case.

A. SCHOOL ACCOMMODATION.

Considerable activity has been displayed by School Boards in improving the school accommodation. Structural extensions and alterations in connection with newly-established Higher Grade Schools have not infrequently had the collateral effect of providing better accommodation for the Primary divisions of these schools, so much so in some instances as virtually to involve a reconstruction and redistribution of the premises.

I begin with the statement on this subject with which H.M. Chief Inspector Mr. Robertson has favoured me:—

Kingussie. "In the matter of supply the mainland section of the District has only one notable feature, and that is the handsome manner in which the Kingussie School Board has met the demand for further accommodation in connection with the enlarged function of the Kingussie Higher Grade School as a Junior Student Centre. Both as regards structure and equipment the school is now well abreast of the most modern requirements. The same Board has built a new school and schoolhouse at Dalwhinnie.

Lewis. Owing to the growing tide of emigration from the island of Lewis in recent years, managers of its rural schools have deemed it advisable to consider with great caution any question of extension of premises, and in consequence little or nothing was done in this direction during the past year. In the town of Stornoway, however, building activity continues unabated. After many years of admirable work, the Female Industrial (Lady Matheson's)

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School has now been closed, and to meet the consequent demand for accommodation, the Stornoway School Board has had to make a further addition to its school premises. On this occasion it is a composite wood and iron erection built in substantial and up-to-date style. This Board has also plans in hand for a large technical annexe, for which a special grant of over £6,000 under the General Aid Minute has been promised. Competitive plans from architects of outstanding merit have been invited, and by next year this important Central School ought in the matter of equipment to be second to none in the Highland Division.

Harris. The recent crofter settlement at Northtown, Harris, under the auspices of the Congested Districts Board, has necessitated the erection of a school and schoolhouse there, and the Skye Snizort Macdiarmid Public School has had to undergo a large extension to accommodate the children from the Skirinish Crofter Settlement. All over the District numerous minor improvements have been made, largely as the result of closer medical inspection. In many cases the ventilating facilities have been completely overhauled and simplified, and the water supply greatly improved. As regards the former, it has frequently been found that costly apparatus became useless through inattention and the lack of proper regulation, and in these cases more especially, the simple and inexpensive system of permanent window ventilation on the Hinckes-Bird principle has been recommended.

Skye.

Minor improvements.

Managers invariably show reasonable willingness to carry out improvements, and I anticipate very marked advance in this direction in the coming session. Co-operation and joint visits with the County Medical Officer of Health have been found of great value.

Aberdeenshire. In Aberdeenshire (excluding the city) there has been much building activity, which promises to continue for some time in connection with the Higher Grade Schools. In some cases, also, other schools, which undertake a certain amount of Secondary Instruction with a view to fitting their Pupils for entrance to Central Schools, require a small extension, or at least a readjustment of the interior space, so as to admit of a certain amount of Science instruction. The enlargement and improvement of Peterhead Academy are very notable. The educational problem at Fraserburgh is being solved by the erection of a new Higher Grade School and other buildings. Enlargements are in progress at Craigton, Turriff, Methlick, Kintore, Logie-Coldstone. Extensions are contemplated at Ellon, Strichen, Wester Hatton and Tipperty Schools. A new school is in course of erection at Monymusk. Minor enlargements and improvements have been effected at Port Elphinstone, Old Rayne, Birkenhills, Buchanhaven, Mintlaw, Midmar, Cluny Old Town, and Barthol Chapel. New schoolhouses have been provided at Towie and Inchmarnoch.

The difficulties in connection with Old Deer School are in process of solution. Improvements are required at Alford Village, at Glashmore, and certain other small rural schools where the accommodation, though technically sufficient, is in some respects unsatisfactory. The Leslie case has not yet been definitely decided.

Kincardineshire. In Kincardineshire, Banchory Central School has been extended, and the school at Cove is to be enlarged.

Orkney. In Orkney, Lady Central School has been considerably improved; minor improvements have been effected at Eday North, Eday South, Tankerness, Burray and Stronsay. Mr. Walker, who has

had ample experience of the state of the schools in this county, makes the general remark :—

"With a decreasing population the accommodation is in every case sufficient, but in a large number of cases the schools are damp, the class-rooms dingy, and the equipment not up to modern requirements."

In Shetland, Levenwick School is being enlarged. Structural alterations, so as to provide class-rooms of a suitable size, are to be made at Virkie, Boddam, Bigton, Whiteness and Haroldswick. The Lerwick infants are to be accommodated in the old public school, when it has been enlarged and adapted, the present infant school being discarded. A new school is to be built at Olnafirth to take the place of the existing school, which is unsatisfactory. It is understood that the East Burrafirth district is for the first time to be provided with a school. A new school is required at Livister. Shetland.

As regards North Forfarshire Mr. Muir states that there is little to report. At Menmuir the premises are being improved. He adds :— North Forfarshire.

"In Arbroath the problem of school accommodation will have to be faced. In Montrose the three Elementary Schools have approximately sufficient accommodation for the children in attendance ; but the difficulty lies in getting them properly distributed."

Mr. Wattie has supplied me with an exhaustive Report on the state of school accommodation in his district. This Report amply attests the activity, enterprise, and progressive policy of the School Boards in general.

1. Dundee.—The enlargement of Lochee Ancrum Road School has now been completed ; the accommodation has been raised from 777 to 1,400 places ; the new building is a highly favourable specimen of a thoroughly modern school ; and a part of the enlarged playground has been laid out as a school garden under the supervision of Professor Patrick Geddes. It is anticipated that the new Stobswell Supplementary School will be ready for occupancy by the beginning of the next session. The managers of St. Salvador's Episcopal School decided to discontinue the school, which could only be improved at a great expense ; the School Board have accordingly arranged to lease the premises until a new school should be erected on a site already secured and on a scale sufficient for 1,200 children. The Harris Academy is to be reconstructed and enlarged in a very effective way. Dundee.

The Board has done much to improve the equipment, class-room accommodation, and ventilation of several of their schools ; but drastic operations are still needed in connection with Balfour Street, Brown Street, Hill Street, and Victoria Road Schools. The Lochee St. Mary's Catholic Schools have been extensively altered and improved. At the Institution for the Blind new music-rooms and a new gymnasium adapted to blind children have been provided.

2. Schools outside Dundee.

Building operations in connection with these schools have been rendered necessary not so much by an increase of the population South Forfar.

as by the diminished size of classes now deemed desirable, and by the requirement of additional class accommodation in virtue of the conditions of the General Aid Grant. The Forfar Burgh School Board has signalised itself by the energy with which it has grappled with educational requirements. The East School has been extended and a large addition to the South School is being erected for the Infant Division and for the accommodation of all the Supplementary Class girls in the Burgh. A new wing has been added to the Academy, and arrangements are being considered for the provision of a gymnasium and for the training of the girls in domestic subjects. A new combination school, excellently planned and provided with all modern conveniences, was opened last January at Abernyte to supply the wants of Abernyte and part of Longforgan parishes. The increase of the population has rendered a large addition to Monifieth School necessary. The Murroes and Tealing Schools are being enlarged. The question of improved accommodation is being considered by the Broughty Ferry, Dundee Landward, Dunnichen, Longforgan, Kinnettles and Monikie School Boards.

Mr. McKechnie's District.

The details given in Mr. McKechnie's report indicate that the School Boards are in general zealously fulfilling their obligations.

Nairn.

(1) *Nairn County.*—Auldearn School has been extended, and the lighting of Moyness School improved. Nairn (B) Church Street School is to be superseded by a handsome new school capable of accommodating 600 children. It is possible that this school may ultimately be rendered commodious enough for the whole school population of the Burgh.

West Ross.

(2) *West Ross.*—The new Badcaul School is excellent—as Mr. McKechnie expresses it, "a palace instead of a barn!" Considerable structural alterations have been effected at Gairloch Opinan School. The offices have been improved at Kintail Dornie and Lochalsh Earbusaig Schools. Scoraig School has been very considerably improved; and Lochbroom Achiltibuie School has had a large cloak-room provided. Ullapool Higher Grade School will soon demand improved premises.

Morayshire.

(3) *Morayshire.*—Some minor improvements have been effected at Fochabers Milne's Institution, at Achanarrow, Dallas, Lossiemouth, Hopeman, Mosstowie, Knockando and Urquhart Public Schools. Burgie School has received an excellent addition, and Forres Burgh School is being considerably enlarged. A new room has been added to Lhanbryd School, and the cloak-room accommodation improved Mr. McKechnie mentions that the premises of Elgin St. Sylvester's Roman Catholic School are far from satisfactory.

Banffshire.

(4) *Banffshire.*—Several of the Higher Grade Schools have been, or are being, enlarged and structurally improved. Buckie and Keith Higher Grade Schools are in this category, and important improvements in connection with the Banff Academy may be expected. The case of Fordyce Academy is singularly complicated, and a definitive settlement has not yet been reached.

The same progressive tendency is observable in the Primary Schools. At Blairmaud an excellent new school has been provided, and the Cornhill School has been virtually reconstructed. At Aberlour Episcopal School two new rooms have been provided, and the Buckie Episcopal School has been advantageously extended. This is also the case as regards Portgordon School. Greater or minor improvements are mentioned in connection with Botriphnie, Lower Cabrach, Inverkeithny Kirktown, Maggieknockater, Tomintoul, Rathven, and Aberchirder (Episcopal) Schools. Mr McKechnie pronounces Findochty and Ternemny Schools to be quite unsatisfactory as regards premises.

Mr. Macdonald's district has been signalised by great activity on the part of the School Boards in improving the accommodation, sanitary condition, and comfort of their schools. This result is largely due to Mr. Macdonald's indefatigable exertions and to the aid which he has received from medical officers of health and sanitary inspectors, whose professional co-operation and advice have had a most beneficial effect. He warmly commends the action of the School Board of Bower, who have with no ordinary thoroughness improved the five schools under their charge. Stanstill School has been made practically a new school; Gillock School, besides being enlarged, has been provided with a new cloak-room and with improved lighting and ventilation; at Barrock School a new cloak-room and shelter-shed have been constructed; while at Stemster and Bower Public Schools alterations have been made tending to the increased comfort of the pupils. The schools in Latheron parish have been considerably improved since last year's report; but much still requires to be done, and Mr. Macdonald, while fully recognising the financial difficulties with which the School Board have to contend, expresses the hope that they will gradually renovate the school premises, beginning with Swiney and Latheron Public Schools as the most urgent cases. Structural alterations have been made at three of the schools in the parish of Halkirk. Expert testimony has pronounced the condition of Mey Public School, in Canisbay parish, to be unsatisfactory, and the School Board are considering the expediency of erecting a new school instead of tinkering at obsolete and unsatisfactory premises. The School Board of Wick Burgh has finally resolved to build a new Higher Grade School, and part of the senior division of Pulteneytown Academy, as also the surplus pupils at North Public School, are being for the present housed in temporary premises. The school at Gersa under the Watten School Board is now under process of enlargement. In the county of Sutherland a new Infant School has been erected at Bonar Bridge, thus rendering possible the transference of the junior classes to the old infant room and the utilisation of the room vacated as a recreation hall during the mid-day interval. The Medical Officer of Health for the County speaks highly of the new offices erected at this school. The building operations have had the collateral effect of radically ending the former insanitary condition of the school. At Durness Public School a new class-room is being built, and the old class-room, which was authoritatively condemned, is to be renovated.

Mr. Macdonald's District.

In the county of Ross enlargements are being carried out at the Public Schools of Tain, Hilton and Alness; a commodious class-room has been added to Dingwall Academy; and the School-house at Fodderty is being reconstructed. The School Board of Tarbat has effected thoroughgoing improvement in connection with Tarbat Public School, having provided a cookery-room, adequate cloak-room accommodation, and shelter-sheds.

The accommodation of Craigston Public School in the Island of Barra is still insufficient. A new school seems to be needed at Grimisay in North Uist to accommodate the children from a new crofter settlement three miles distant from the existing school, and plans have been prepared for this purpose.

Mr. Macdonald concludes his statement on the subject in the following terms:—

"In addition to the enlargements already mentioned important structural alterations and improvements have been, or are in process of being, carried out at Forss, Aukengill, Keiss, Durran, Murkle, Thrumster, and Staxigoe Public Schools in the county of Caithness; at Nigg and Pitcalnie Public Schools in the county of Ross; and at Rhilochan, Shinness and Helmsdale Public Schools in the county of Sutherland. It is clear, therefore, that the year has been characterised by more than ordinary activity on the part of he School Boards."

One would be glad to see similar activity in many other parts of the country, where financial and other difficulties press much less heavily.

Many of the details given under this head are not indeed of much more than local interest, yet they are instructive and suggestive as indicating a widened conception of those conditions of school life which contribute to the comfort and physical well-being of the children in attendance at school, and to the consequent improved efficiency of the instruction. A vitiated atmosphere is probably to a considerable extent responsible for a low standard of attainment in the elements of instruction, and the interruptions to attendance at school will be much fewer when proper cloak-room accommodation, shelter-sheds, and a supply of uncontaminated water diminish the tendency to juvenile ailments of various kinds. Some of us have had experience of localities where, owing to the prevalence of insanitary conditions, infectious disease was practically endemic.

Sanitary condition of school premises.

These points have received careful attention in the reports with which my colleagues have favoured me regarding school-supply. This has always been recognised as an important element of H.M. Inspectors' work; but the improved conceptions of sanitation and comfort in the school which now prevail are rendering this function much more prominent and effective. Under the present conditions, also, of inspection there is much more time available for a searching investigation of the state of the school premises. Formerly the demands of the Standard examination, minute and exhaustive as they were, often left the Inspector very little time for the thorough discharge of this duty; his mind was preoccupied with a multiplicity of detail which thrust into the background the more external conditions of instruction, and every-

Its recognition under former conditions.

thing that did not forcibly obtrude itself upon his attention was apt to be ignored or perfunctorily considered. This being so, both managers and teachers were disposed to follow the Inspector's example, and to lay a preponderating stress upon the results of the instruction, to the comparative neglect of material conditions and surroundings upon which the efficiency of instruction largely depends. If, for example, the ventilation of a school is defective it is certain that the healthy activity of the brain must be considerably impaired; and criticism of the ventilation might often have usefully preceded criticism of the educational results. In these respects science, and particularly bacteriological research, have done much to raise the ideal of school requirements, and from this point of view certain insanitary arrangements are either being abolished or may be expected ere long entirely to disappear. For example, the employment of dividing curtains and the use of corridors for cloak-room accommodation should be, and ultimately will be, entirely discarded. Inspectors have often found it difficult to impress managers of rural schools with a sense of the objectionable character of arrangements and conditions which are sometimes tolerated even in private dwellings; but this difficulty is being gradually removed by the downward filtering of scientific conceptions of hygiene through all classes of society, and it may be confidently expected that the improved hygiene of the school will have a beneficial reflex effect upon the hygiene of the home. But more is involved than merely hygienic considerations; all the exterior equipment of the school should be of such nature as to suggest and maintain a high standard of self-respect and decorum on the part of the pupils. In all such matters the co-operation of the sanitary authorities, of which several of my colleagues have availed themselves, is of the utmost value. From this point of view nothing is of greater importance than the condition of the offices, their construction, cleaning and deodorisation; in all which particulars there is a very general need of improvement. And, just as the teacher's influence is potent for the promotion of regular attendance, so also his systematic supervision of the state of the offices, accompanied by hints and directions to his pupils with regard to the proper and seemly use of them, would to a large extent correct or obviate those irregularities which are so often disagreeably manifest.

Ventilation.

Cloak-room accommodation.

The offices.

B.—Staffing.

On this subject H.M. Chief Inspector Mr. Robertson has the following remarks to make.

"The scarcity of competent teachers at present, and especially of a subordinate staff, is a fact of marked importance in any educational survey of the district. There has been quite an exodus of young teachers to the Training Centres, and while one must entirely approve of the desire to get full training, the embarrassment caused to rural managers is rather serious. I invariably recommend them to keep the Department informed of any difficulty as to staff supply, and I have no doubt that an equitable tolerance will be shown in cases where temporary shortage of staff is proved to be unavoidable. In the more remote school districts the situation gives much

Scarcity of teachers.

concern, but I can testify to the diligence and interest of managers and to the hearty co-operation of head teachers to do their best in the trying circumstances."

Mr. Macdonald similarly comments upon the deficient supply of teachers in his district. He points out that until recently the smaller schools were well staffed in virtue of the application of the General Aid Grant (Section II. *d.*), but that as a result these smaller schools had the teaching staff increased to the prejudice of the larger schools, and he suggests that the terms of the above Section might advantageously be readjusted so as normally to exclude from the benefits of the Grant in question those schools whose average attendance is less than 40. He continues :—

"While the ultimate effects of the operation of the Regulations for the Training of Teachers will no doubt be in the highest degree beneficial, the immediate effect is a rather serious shortage in the supply. A considerable number of untrained teachers have taken advantage of the wider opportunities for training offered to them under the new system, and it is found in some cases next to impossible to fill their places. Naturally the remote schools are affected most, but even in the larger and more accessible centres managers are complaining of the increasing difficulty they are experiencing in filling gaps in the ranks of their teaching staff."

The condition of the pupil-teachers under the new system is quite clearly moribund. For one thing, the limitation of the number of hours for actual teaching in the schools renders their employment uneconomical. The result need not excite more than a merely sentimental regret. Under former conditions the burden imposed upon them was far too heavy; five hours' hard work in school left them little energy for private study, or for the reception of instruction. The May Examination tended every year to show serious short-comings in those pupil-teachers who had not the advantage of attendance at a Secondary or Higher Grade School, and this particularly as regards Languages and Arithmetic. In this connection Mr. Robertson's remarks are worthy of note :—

"The gradual passing of the rural pupil-teacher is acquiesced in all round. It is significant that very few could face the Intermediate Certificate at the end of the second year, and I cannot look forward with much satisfaction to the results of the same test, postponed as it has been in so many cases for a year."

The effect of the new Regulations on the larger town schools is exemplified in the case of Dundee. Mr. Wattie reports as follows :—

"In view of the decision come to by the Dundee and several other of the larger School Boards to discontinue the employment of pupil-teachers it may be interesting to have some figures regarding them for the past year. The total number for all the schools in the district was 130, the distribution among the Dundee public, Dundee voluntary, and other schools being 52, 29, and 49 respectively. The indentures of all the pupil-teachers under the Dundee School Board terminated in June, 1907, with one exception; and it is very pleasant to be able to report that they all qualified for admission to the University or the Training College except two."

Mr. Macdonald has a useful note on this subject. He says:—

"One advantage of the option left to managers to continue appointing pupil-teachers—even if it is impossible to provide for their instruction in all the subjects of Article 69 (*b*) of the Regulations—is that in remote districts it may be possible to give what will be virtually an Intermediate Bursary to a bright pupil, not otherwise provided for, and thus, through the operation of the footnote to Article 69, (*g*) of the Regulations, pave the way to a Junior Student Centre."

Mr. Philip has supplied me with useful information regarding the position of the pupil-teachers under the new conditions. The details may be thus summarised:—

(1) As regards Aberdeen City the School Board has decided to indenture no more pupil-teachers. Those already indentured will complete their apprenticeship under Article 69 (*i*) of the Regulations.

(2) In Aberdeen County, of those whose engagement has not yet expired, 19 will take advantage of the note to Article 69 (*i*) while the remaining 54 will complete their apprenticeship. In five schools indentures have been cancelled in favour of Junior Studentships.

(3) In Kincardineshire two indentures were cancelled. Those whose apprenticeship has not expired will conform either to paragraph (*i*) of Article 69, or to the note appended.

4. In Orkney 12 pupil-teachers finish under the Note to Article 69 (*i*). Pupil-teachers remain in Kirkwall and other five schools; but at Kirkwall no more pupil-teachers will be indentured. In two of these five schools Science instruction will be provided; in the remaining three this is found to be impracticable.

5. In Shetland two indentures have been cancelled. Five apprenticeships will terminate in 1908 under the note to Article 69 (*i*). In the case of other two pupil-teachers it has been found impracticable to arrange an adequate course of instruction.

C. School Attendance.

Excluding casual and temporary conditions, such as an outbreak of epidemic sickness and the exceptional severity of the weather, we find that on the whole the state of the attendance remains much the same. Under the impetus, however, given to sanitary precautions we may anticipate a progressive improvement under normal circumstances. It might be interesting to discover how far the absence of over-pressure under the new methods of inspection has affected the attendance; but probably the lively sense of personal responsibility and anxiety to secure a "pass" which resulted from the "standard" examination may have balanced the deterrent effect of the severer task-work exacted.

Causes of irregular attendance.

Mr. Robertson reports as follows:—

"As a general statement attendance is less satisfactory than in the previous year in many school areas. The unusual severity of the weather last winter and spring may safely be postulated as the chief cause of the decline. Pressure on Boards to exercise their compulsory powers has certainly not been wanting and constant vigilance seems to be required. Occasionally, the general effect of prosecution is less marked on average attendance than one might expect, but even then an active Board should get credit for its diligence. Reluctance to prosecute before a Justice of the Peace or Sheriff Court is less the mood of the rural School Board than it was.

Mr. Wattie's District. Causes of irregular attendance.

Mr. Wattie reports that the average attendance for the District was slightly affected by the temporary closure of certain schools in consequence of the prevalence of scarlet fever and cerebro-spinal meningitis; a still more potent factor was the outbreak of measles, towards the close of 1905, which unfavourably affected the statistics for the voluntary schools whose financial year terminated in the late autumn of 1906; but on the whole it would appear that the state of the attendance in general is stationary.

Dundee.

For the 22 public schools in Dundee the summary percentage of attendance is 87·7. Only a single school, that of Hawkhill, reaches a percentage of over 90. Of the 10 Voluntary Schools three have improved in regularity of attendance, while seven have declined. St. Joseph's R. C. School heads the list of Dundee schools with an average attendance of 91·3. The schools outside Dundee show to greater advantage in this respect. The summary percentage for these schools, 51 in number, is 88·7; and 19 schools reach a percentage of 90 or over as compared with 17 last year.

Forfar Burgh.

The schools in the burgh of Forfar maintain their high position, the summary percentage being 91·3. An improvement has been effected in Barry parish in consequence of the more energetic exercise by the School Board of its compulsory powers. The summary percentage for the entire district is 88·0, as compared with last year's 88·2. Mr. Wattie concludes his exhaustive Report with the following remarks:—

"Reference was made in last Report to the irregularity prevalent in many of the country parishes during the short season between the mid-summer and the potato-lifting vacation, and the suggestion was made that it might be advantageous to the attendance to bring forward the summer vacation a month earlier. The rural instincts follow, on the whole, a conservative line, and the fact that the financial year of a number of the country schools ends in June is a minor obstacle; but this year several have in this matter adopted the policy of the city schools."

Mr. McKechnie's District.

Mr. McKechnie expresses disappointment with the state of the attendance in his district. He states that the percentage has fallen in Banffshire and risen in Morayshire, Nairnshire and

Ross-shire (of which, however, only a part is within his district.) He subjoins the following tabular statement of statistics :—

	Banffshire.		Morayshire.		Nairnshire.		Ross-shire.	
	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.
School Population - -	13,017	12,975	8,332	8,367	1,516	1,518	13,770	13,436
Scholars on Register -	12,984	12,954	8,624	8,575	1,647	1,660	13,738	13,432
Average Attendance -	11,519	11,430	7,326	7,396	1,422	1,436	11,692	11,561
Percentage of Average Attendance -	88·95	88·24	84·95	86·25	86·34	86·51	85·11	86·07
Exemptions - - -	247	293	30	42	1	2	13	10

He points out the curious anomaly that in Morayshire, while the school population has increased the number on the registers has decreased, with however an increase in the percentage of attendance.

The school population and Number on the Registers.

Mr. McKechnie also deals with the very important relation between the school-population and the number on the registers. Manifestly for any given year this relation will be affected by the age at which children are sent to school. His tabular statement is as follows :—

"1906.

	School Population.	On Register up to 14.	Difference.
Banffshire - -	12,975	12,249	−726
Morayshire - -	8,367	8,098	−269
Nairnshire - -	1,518	1,565	+47
Ross-shire - -	13,456	12,386	−1,070

i.e. in Nairn the roll seems to be complete ; in Elgin it is fairly complete ; in Banff it is much less complete than in Elgin ; and in Ross it is very incomplete.

In the case of Ross this is no doubt due to the difficulty of getting young children to school in remote parts."

Mr. Macdonald's District.

Causes of late enrolment.

Mr. Macdonald states that the attendance at school continues to be satisfactory. An endeavour is being made in certain parts of the district to secure the earlier enrolment of pupils. He mentions two causes of late enrolment, negligence on the part of School Boards, and the distance of the school from the pupils' homes. In isolated localities where the roads are bad or non-existent it is sometimes the case that parents refrain from sending their young children to school even in summer on the ground that, when once their children's names are entered on the school-roll, attendance will be insisted on during the winter. Mr. Macdonald thinks—and no doubt School Boards will be equally

reasonable—that a certain amount of irregularity in the winter months may well be condoned under such untoward conditions.

He supplies an instructive tabular statement of percentages in his district, which I here subjoin :

	Number of Schools.							
	Under 80 per cent.		80 to 85 per cent.		85 to 90 per cent.		90 per cent. and over.	
	1906	1907	1906	1907	1906	1907	1906	1907
Caithness - - -	2	3	21	23	30	27	10	10
Inverness - - -	4	4	5	5	15	17	5	3
Ross - - - -	1	1	13	13	15	21	9	3
Sutherland - - -	6	4	17	17	15	20	8	5

Causes at work.

The fall in the percentage as indicated in the last column is to be attributed to the exceptional severity of the weather, followed to some extent by epidemic sickness.

Influence of the teacher.

Mr. Macdonald very justly emphasises the important influence which the teacher is able to exert in promoting regularity of attendance. As it is sometimes put—a good teacher is the best compulsory officer. The School Boards are, however, technically held responsible, and Mr. Macdonald reports increased activity on their part in several districts where apathy formerly prevailed. To use his crisp expression: "Some Boards, after protesting vigorously that they had done their best, are doing better."

Among the energetic Boards he places Wick Burgh and Landward, Roskeen, Alness and Barra. Unfavourably contrasted with these are Tongue, Clyne and Assynt in Sutherland, and Canisbay in Caithness. As a result the Grant under Art. 19 B(6) of the Code was either refused or seriously endangered. He further points out the important relation which the removal of the children's names from the school registers bears to the question of attendance. He remarks :—

Removal of names from the Registers.

"One has to be careful to avoid ascribing to more regular attendance what may really be due to more active purging of the roll."

Fisher-children.

In this connexion the case of fisher-children who migrate with their parents annually to fishing centres falls to be considered; but the removal of their names was deemed unnecessary in view of the fact that their period of absence roughly coincided with the school vacation. The removal of their names also sometimes led to their withdrawal from the purview of the School Board.

Mr. Philip makes some important and stringent observations regarding school attendance in Shetland, and I cannot do better than quote them in full :—

Mr. Philip's District.

"Despite the wretched weather conditions of last winter the attendance in Shetland shows this year a slight improvement. I cannot understand why certain School Boards in this county do not take an example from their neighbours and endeavour to remove the stigma of bad administration which rests upon them. The Landward schools under the Lerwick Board do not seem to differ in any respect from the schools in other parts of the county

as regards external conditions, and yet in these three schools (Quarff, Gulberwick, and Hamnavoe) the average attendance for the year is over 95 per cent.

"In some districts children with any distance to come cease attending the moment winter begins. Winter begins, apparently, on 1st November, and hence we find in the Log-book under that date: 'Only seventeen children in the school owing to its being the first day of winter.' The particular day in question was found from the meteorological records to be a mild day with moderate southerly wind and five hours of bright sunshine. But it was the first day of 'winter,' and half the scholars began their winter rest. Mr. Topping quoted.

"The attendance at four schools on the 31st January may be given as illustrating how this varies with different districts and teachers: At Quarff 27 were present out of 27; at Cunningsburgh 72 out of 116; at Sandwick 33 out of 123. At Levenwick under 33 per cent. had been present and the opening had been cancelled.

"The withholding of the Grant under Article 19 B (6) from some of the Shetland School Boards has had a salutary effect. It is particularly noticeable that the number of closures due to inclement weather varies considerably, even for schools in the same parish. It is the practice of some teachers to send home the few children who put in an appearance on a stormy day without opening school at all. A child who turns up only to find that no school is to be held is not likely to be sent again by his parents when the weather is doubtful." Mr. Rankine quoted.

D.—Exemptions.

Mr. Philip comments upon the number and conditions of the exemptions as granted by the School Boards of Orkney. These exemptions are mainly for herding purposes during the summer months. He fears that some Boards are administering the Act of 1901 without a due sense of their administrative and financial responsibilities. He contends that the two indispensable conditions of exemption are necessitous circumstances and excellent previous attendance at school to the minimum extent of 90 per cent.: in both of which respects there is room for animadversion. As regards the former of the two conditions he points out that the number of exemptions is relatively much greater in Orkney than in Shetland, although *prima facie* there cannot be a greater number of necessitous cases in the former than in the latter county. He repeats his recommendation in last year's Report that a soup-kitchen should be provided in the winter months for the schools in these two counties, as likely to have a favourable effect upon regularity of attendance. Mr. Philip's District. Orkney. Grounds of exemption.

Mr Wattie's remarks on this subject are so important and suggestive that I quote them in full:—

"The jute industry in Dundee has been on the whole in a prosperous condition during the past year, and it might have been expected that the briskness of the labour market would have been accompanied by a further reduction of the exemption figures. They are, however, practically stationary as compared with last year; and Dundee is left in unchallenged Mr. Wattie's District.

possession of its bad eminence in this respect. The following table gives the exemption statistics for the last four years :—

	Exemptions Granted.			Total granted	Refused.	Total Applications.
	Without conditions.	On conditions of Evg. S. Attce.	On conditions of H.-T. Attce.			
Session 1903–4	6	736	876	1,618	953	2,571
„ 1904–5	4	356	396	756	1,098	1,854
„ 1905–6	0	236	338	574	811	1,385
„ 1906–7	1	251	342	593	746	1,340

"The sum of the full-time and half-time exemptions granted does not represent the same number of individual children, as the general policy of the Board is to grant half-time exemption in the first instance to younger applicants, a certain proportion of whom subsequently get complete exemption from day school attendance.

"The attendance in the supplementary classes in Dundee is markedly less regular than in the senior division, particularly among the girls. While excess of irregularity is doubtless largely due to the fact that the supplementary children are older and consequently more useful at home, one cannot but suspect that the spirit of unrest produced in the classes as a whole by the granting of exemption even to the present modified extent is a contributory cause. The exemption problem having now been reduced within comparatively moderate limits, the time seems to have arrived for the School Board to take another forward step, as the cases of real hardship would not now be so numerous as to be beyond the power of the combined operations of the poor-law authority and public and private charity to cope with. If a still further reduction in the number of exemptions were effected, it seems probable that an improvement would result in the general attendance of the older pupils.

"In the part of the district outside of Dundee the discretion vested in the School Boards in regard to the granting of exemption seems on the whole to have been wisely exercised. The exemptions granted by the Forfar (*B*) Board have fallen from 124 to 102. There and at Broughty Ferry special continuation classes are held during the winter, as in Dundee, for the pupils who have been granted conditional exemption. In the rural parishes the few exemptions granted are nearly always complete."

Mr. McKechnie's District.

The question of exemptions has been engaging Mr. McKechnie's serious attention during the past year, as he is convinced that in certain districts, and particularly in Banffshire as a whole, the School Boards are granting these exemptions much too liberally.

He presents the facts in the following tabular form :—

	Scholars on Register.	Number of Exemptions.	Per 1,000.
Banffshire - - -	12,954	293	22·6
Morayshire - -	8,575	42	4·9
Nairnshire - -	1,660	2	1·2
Ross-shire - - -	13,432	10	·7

The disproportion between Banffshire and the other counties is certainly striking.

Relation of Exemption to Social Conditions.

While the applications for exemption indicate the existence of social conditions which appeal very strongly both to the philanthropist and the reformer, there is a still lower stratum of the adult population which is either totally indifferent to the benefits which education confers or is unable to exercise parental control. In many such cases the home circumstances are so deplorable that it is hardly possible to secure regularity of attendance. If even industrious and respectable mothers find it no easy task to send their children to school comfortably fed and tidily clad, what is to be expected of those whose drunken habits or domestic miseries render even the smallest modicum of home-comfort for their unhappy children almost unattainable. It is in the large towns and larger centres of industrial and mining activity that School Boards have to endeavour to cope with this serious difficulty; nor do they ignore their responsibilities. Thus, as Mr. Wattie reports, the School Board of Dundee summoned before them last year 192 defaulting parents and instituted prosecutions against 71, with the result that convictions were obtained in every case brought into Court, and in four cases the maximum penalty was imposed. The number of defaulters registered during the year was 968, and the number of cases carried forward to the current session was 582, of whom 35 were sent to Industrial Schools or to the Mars Training Ship, and 16 were taken in hand by the Parish Council. Many of the defaulting parents show a perverse ingenuity in evading penal consequences; they send their children for a few days at a time to school, and so escape the onus of continuous irregularity. To use Mr. Wattie's trenchant statement—"the difficulty in the case of most of these children is that they are regularly irregular."

Dundee.

Remedies.

To combat this tendency towards irregular attendance on the part of children belonging to a low social grade, the School Board of Dundee have continued the use of a remedial expedient to which reference was made in last year's report, and with regard to which Mr. Wattie reports as follows:—

Domestic Visitation.

> The scheme of visitation by lady workers belonging to the Dundee Social Union, which was begun early in 1906, was continued systematically last session in connection with two of the Dundee public schools attended largely by children of the poorer classes. In the opinion of the teachers this work is proving a valuable auxiliary to the schools by securing a better attendance in bad cases and promoting in several directions the general well-being of the children. The ladies devote a large amount of time to this visitation and their testimony goes to corroborate the common experience of those who devote themselves to the arduous work of social amelioration, that the more constant and personal the attention given to particular cases the more marked is the resultant improvement in the conditions of the home-life."

If to irregular attendance during the session is added the unsettling influence of the summer vacation, we may anticipate benefit from the adoption of a counteractive arrangement which seeks to rectify resulting educational shortcomings. This

arrangement is the establishment of a Vacation School, with reference to which Mr. Wattie supplies the following information :—

Vacation School.

"The experiment was made in Dundee this summer, for the first time in Scotland, of holding a vacation school. The School Board granted the use of the Dunhope School premises, but in other respects the venture was conducted on a voluntary basis. The enrolment was limited to about 200, one-half of the children attending for a fortnight in July and the other half for a fortnight in August. The school was conducted under the management of one of the Dundee headmasters, who was assisted by several other teachers and Social Union workers. The programme followed the general lines laid down by the pioneer vacation schools instituted in London by Mrs. Humphrey Ward, and the opinion of those interested is that the experiment was attended by such a measure of success as to justify the hope that the school may develop into a permanent institution."

E.—Organisation and Classification.

Promotion.

Under this head several of my colleagues have supplied me with useful contributions, and mainly with regard to re-classification at "fixed dates." In large town-schools little practical difficulty is experienced ; the pupil is transferred from one class-room to another ; but a certain amount of difficulty does really exist in bipartite or tripartite schools, *i.e.*, schools with two or three class-rooms respectively. In such cases the re-classified pupils are sometimes merely transferred from one part of the school-room to the other. But even this may have a good effect. As Mr. Macdonald suggestively remarks :—

"A segregation, owing to promotion, of the smarter pupils, who naturally need less supervision, would provide a salutary stimulus to all, and would enable the teacher to give special attention to the weaker pupils."

Alleged Objections to Promotion.

He states the objections to promotion of pupils during the session, which are not infrequently urged by teachers. These are two :—

"First, the difficulty of accommodation, a redistribution of the pupils entailing a possible overcrowding in some rooms ; and, second, the difficulty of staff, owing to the restriction as to the number of pupils habitually under one teacher."

Mr. Muir refers to the same difficulties, and mentions the suggestion made by the headmaster of a large school, "that the Department, while insisting on a staff bearing a certain numerical relation to the total number of pupils in ordinary attendance, might give the headmaster a freer hand in the distribution of that staff."

Causes of non-Promotion.

It may be conjectured that the magnitude of the difficulties has been exaggerated by prepossessions in favour of the old "standard" procedure and by a latent disinclination on the part of teachers to part with their smartest pupils. It may be pointed out, however, that in any systematic process of re-classification, if there is movement upwards there is also movement from below, so that the "flowers of the flock" are succeeded by a second growth. The objection to possible overcrowding as a result of promotion is met by the same argument, though only on the supposition that the promotion is selective, not mechanical. Promotion of a class *en bloc* is not promotion at all, it is merely a more rapid transference of a class from one part of the school to another.

Moreover, the teacher has in his own hands the means of preventing possible overcrowding; the standard of promotion is nowhere formulated, and can within limits be adjusted to suit the special circumstances of the school. The teacher will no doubt have clearly outlined in his own mind the ideal stage of promotion for a given class at a given time, but the realisation of this ideal stage will vary from year to year in accordance with the average calibre of the class. In some extreme cases promotion may not even be possible during the course of the session. In a word, a certain amount of accommodation in the application of the principle of promotion is claimed by the special circumstances of the individual classes and of the school as a whole. The dominating consideration will be the adjustment of the conditions of promotion to the passing of the Qualifying Examination as soon after 12 years of age as possible. The first step will therefore be the determination of the range of attainment for each division of the school with this aim in view; the next will be the distribution of this range of attainment over the classes constituting each division. And it is only by the application of this principle of promotion that pupils will be prepared for entrance into the supplementary section of the school at such an age as will render them able to reap the full benefits of supplementary instruction.

Mr. Philip's observations on the subject may usefully be quoted:—

"In actual practice it is impossible to have a perfect gradation. The personal equation of the teacher and of the class are two disturbing elements. But the headmaster who has the ideal gradation clearly in his mind has a standard by which he can measure the progress of any given class and describe its position relative to others in the series.

"Form 62 (*a*) is an outward test of the success of such a system. Does the school qualify pupils for Supplementary Class work more than once a year? Of the 21 city schools, where such promotions are to be expected at least twice a year, I find that, during 1907, Forms 62 (*a*) were submitted and approved for 1st January and 1st August in 19 cases. At the first 'fixed date' the number of pupils varied considerably, showing that in many schools, although not all, the 'creaming' process had been applied. At the second 'fixed date' more than one class was in some cases presented, showing that at the top end of the school the classes were marching abreast and not in line 'tandem-wise.' The conditions at the point of the curriculum represented by Form 62 (*a*) are complicated in two ways: first, the smaller number of pupils that can form a Supplementary Class; second, economy of staff. A serious discontinuity is thus felt, and the headmaster has to exercise all his ingenuity to effect a satisfactory arrangement."

F.—Subjects of Instruction.

Effect of Recent Memoranda.

Most of my colleagues have this year judiciously refrained from discussing methods of instruction. This is in fact no longer necessary in view of the series of memoranda which have been issued by the Department or are in process of preparation. These memoranda, while disclaiming the character of finality, indicate in copious detail the principles and methods of instruction which the Department approves, they are easy of reference and severally complete, and are already having a most valuable effect in

stimulating the minds of the teachers, in superseding mechanical methods of instruction and in securing to a considerable extent uniformity in the methods applied to the several subjects of instruction. It is particularly desirable that assistant teachers, no less than headmasters, should study these documents, for it is a matter of common experience that young assistants, even after receiving in their Training College course a rational and enlightened discipline, not infrequently relapse into the mechanical and antiquated methods of instruction with which they were familiar either as pupils in school or as pupil-teachers. This tendency is fostered by the still prevalent idea that something equivalent to the old standard examinations is still required, with the result that these teachers are prone to attach much more importance to concrete acquisitions than to rational principles.

There is one point in connection with these memoranda which is of great importance, and that is the way in which they suggest the correlation of the subjects of instruction. In the memorandum on the teaching of English, for example, the inter-relation of the constituent branches of English, including even Phonetics and Breathing Exercises, is fully detailed, and thus suggests a closer cohesion of the subjects classified as English rather than their piece-meal or patch-work treatment. But between several of the main subjects themselves there are strong bonds of connection which are too often in practice neglected. Some of my colleagues point out in this connection History and Geography, Nature Knowledge and Drawing; and the list may be extended. A too slavish adherence to the time-table is often responsible for the dissociation of closely related subjects. One of the most interesting ways in which this correlation of subjects has been established is the relation of Arithmetic to Experimental Science ; and a little thought on the part of the teacher would often suggest equally useful and instructive combinations.

While it is no longer necessary to suggest improvements in the methods of teaching the Elementary Subjects, with regard to which the memoranda supply sufficient information, there are in my colleagues' reports a number of criticisms and comments relating to these subjects, which are too useful to be ignored.

(1.) Reading.—Mr. Macdonald remarks :—

Use of Phonetics.

"As regards the mechanics of reading, greater clearness of utterance is pretty generally desirable. One of the most effective ways of bringing about improvement in this respect would be to give the teachers a course in phonetics under Article 55 of the Regulations."

Phonic Method.

In last report Mr. Wattie gave his experience with regard to the Phonic Method of learning to read, and Mr. Philip in his present report resumes consideration of the subject. His remarks are as follow :—

"The teachers inthis district are becoming more and more interested in the phonic method of reading. It is not strange that the mechanics of reading should be the part of the early instruction in English which attracts the teacher : for in the first place it involves no strain on the imagination or the emotions, and secondly the return for the labour expended is immediate and easily assessed. The interest of the phonic method is that,

unlike other so-called methods, it is a rational process. The sound and the symbol are at once connected : "Look and Say". It contrasts with the traditional course which introduces the name and the symbol together, and allows the scholar to arrive at the sound by a process of unconscious cerebration. The order of presentation of the symbols is not immaterial. The first difficulty which the scholar meets is the joining of two sounds to form a word. A M consists of two sounds which the pupil knows separately and individually. To effect the junction appears to be to the young scholar a really difficult step. (It is no doubt this difficulty which leads some teachers to take as the unit of sound not the sound of the single letter but the combined sound of two letters.)

"After the short vowels are introduced the continuous sounds (f, m, n, s, r) can be taken and placed either before or after the vowel. The stopped (explosive) consonants (p, t, &c.) should obviously be taken in the first place after a vowel, as, in that position, they have exactly the same sound as when they are pronounced alone. The step from A T to T A is an easy one. This latter sound (unlike, *e.g.*, F A) cannot be analysed into two distinct sounds, and therefore the explosive consonant in that position must always be taken with the vowel which follows and any attempt to analyse the combination further only introduces confusion.

"The long vowels (with the same symbols as for the short vowels), the double symbol representing a single sound, and the silent letter must appear early.

"This synthetic process starts from the single letter as the symbol for the unit of sound, and by a combination of units builds up the word, or the syllable and afterwards the word. It is therefore a process that is applicable throughout the entire school, and if it were practised as it ought to be in the junior and senior classes, one would not meet pupils, as one often does, who have no power of attacking a word (although it may be perfectly regular) which they have not seen before. Also it is a distinct gain to be able to explain exceptions in terms of the regular symbols which represent the sounds of the irregular syllables.

"The interest of the scholar in the early stages must be kept alive by the early introduction of words with which he is already familiar in the spoken language, and thence of reading material which attracts his attention for other reasons than merely the phonic processes."

Whatever opinion is held respecting the value of the phonic method at the initiatory stage it is evident that the very next stage in the reading process presents anomalies for which correctives must be applied. The vowel *a* has a different sound in *mat, mate, fall, father,* to which the phonic method furnishes no guide; and it would appear desirable to employ accents or other diacritic marks, such as were employed in Saxon, Icelandic and other Germanic languages. Silent letters form another stumbling-block; and I have found it useful to write them on the black-board in red or blue chalk.

Silent Reading.

Almost all my colleagues report an increase in the practice of home-reading and of silent reading in school, and express satisfaction with the results.

Thus Mr. Robertson says :—

School Libraries.

"One has again gratefully to acknowledge the benefaction in the shape of school libraries by Mr. Coats of Paisley. The list of subsidised schools has been extended, and practically every school in the district, including the remote St. Kilda, has a well-selected library. Home-reading has become an established habit. This is a great educational triumph."

As regards silent reading, Mr. Philip remarks :—

"The importance of having a variety of silent occupations becomes more and more felt as it is realised that a greater demand is now being made for

individual effort on the part of the pupils. The class must be taken in small sections whenever individual oral exercises are being done, the rest of the scholars being meanwhile silently occupied. The easy continuous reader is a valuable form of silent work."

There can be little doubt that teachers have not yet fully realised the benefits of silent reading. They would find that the best means of developing the mechanical art of reading in backward pupils is to give these pupils some tale of adventure, the absorbing interest of which almost compels them to master the mechanical difficulties. Herein consists the value of the continuous reader to which Mr. Philip refers.

Teachers' Opinions.

(2). *Grammar.*—Mr. Macdonald gives in full detail the results of his attempt to ascertain the views of the teachers in his district on the teaching of Grammar. There is space for only a short *précis* of his interesting statement. He submitted to these teachers two queries :—

1. Do you consider formal Grammar a necessary part of the curriculum of an Elementary School ? If so, for what reasons ?

2. Is it your experience that instruction in Grammar produces greater correctness in English Composition ? If so, to what extent do you think Grammar should be taught *for this purpose* ?

The replies to the first query yielded this result : 31 teachers answered "no" unreservedly, 15 "no" with reservations, 73 "yes," of whom 19 think that Grammar should be limited to the senior classes. Some of the reasons for the rejection of Grammar are—Children learn English by imitation and by reading good books ; Grammar takes up too much time, and the results are not commensurate with the time expended on it.

As regards the second query, 88 teachers answer in the affirmative, adducing as reasons that Grammar supplies a useful mental gymnastic, that it gives a convenient nomenclature, that withoutit a teacher can only empirically pronounce an expression to be right or wrong, and that it is indispensable for the acquisition of foreign languages. The general opinion, however, of those who approve of instruction in Grammar appeared to be that minute detail was undesirable and that the range of study indicated in the Memorandum on English was sufficiently ample.

Mr. Macdonald's experiment suggests the idea that it would frequently be useful to elicit the views of teachers on educational problems.

Improved Composition : Its Causes.

(3.) *Composition.*—My colleagues report a general improvement in this subject, due apparently to a number of circumstances, *e.g.*, systematic home-reading, increased attention to sentence-formation in oral answering, the transference to Composition of much of the time formerly given to the superfluous technicalities of Grammar, &c.

Rationale of Operations.

(4.) *Arithmetic.*—It is generally recognised that a much greater amount of time is given to the rationale of Arithmetical processes, but one or two inspectors are of opinion that the pendulum has

swung too far in this direction, and that facility and accuracy tend to be sacrificed to intelligence. Probably, however, defects in facility and accuracy are in a much larger measure due to the anomalies and absurdities of our weights, measures and monetary subdivisions. Until these are abolished by the substitution of a rational system, Arithmetic must always be a specially difficult subject; and it is one of the beneficial results of the teaching of Experimental Science that it is paving the way for this much-needed reform.

Need for a Metric System.

(5.) *History and Geography.*—Mr. Macdonald reports that the correlation of these two subjects is being increasingly appreciated. He adds :—

Their Correlation.

"I look forward to the issue of Memoranda on the teaching of these subjects, not so much for the guidance they will give, but because they will afford a convenient basis of discussion, awaken criticism, and lead to examination of current methods."

Mr. Wattie includes in his report some fresh and pertinent comments on these subjects furnished by Mr. Munro. He reports that children take more interest in the Geography than in the History lesson.

"This may be accounted for in several ways. The geography of the world is brought home to them by familiarity with foreign productions and by the constant supply of foreign news in the newspapers, whether it be the Russo-Japanese War, a shipping disaster on some foreign coast, or the starting or return of a Polar expedition. Friends and neighbours emigrate to Canada, South Africa, or Argentina; and at seaport towns cargoes of timber, jute, or oil-cake keep up the interest. It is thus easy to bridge over the gulfs of space : those of time are all but impassable."

Superior Interest of Geography.

As regards Geography he makes the following strictures :—

"In so far as the schools do not yet make the most of Geography the following may be stated as the defects :—

"There is a strong tendency to keep it wholly as an indoors subject to be learned from books and maps. It is rare to hear of a teacher taking his class to a hill from which a view can be had or exploring with them the course of a stream. In the early stages especially the geography of the neighbourhood should be learned out of doors.

Defects of Instruction in Geography.

"There is too early and too exclusive use of maps. These are frequently presented to the children before they can realise what a map is or how it has been constructed. The old method of making a plan of the schoolroom had only one fault—it did not go far enough. The map of the surroundings of the school should also be constructed from actual exploration and measurement (whatever the method of measurement may be) and the process should be carried as far as practicable outwards from the school, any suitable elevation being utilised to obtain a view from which the bearings of places may be taken as well as their approximate distances. Once a child has constructed a map from his own observations and drawn it on a large and a small scale he will be ready to understand the school maps. . . There is still a want of vivid description and pictorial illustration, though progress in this direction is very marked. The school-books on Geography are in some cases of the highest excellence. We are reaping the full fruit of our easy and extended communication with other lands, and of the popularity of photography."

Use of Maps.

Pictorial Illustrations

I regret that considerations of space prevent me from quoting in full Mr. Munro's very suggestive contribution.

6.—Nature Knowledge.

Difficulties of the Subject.

The most that can be said of this subject of instruction is that it shows promise. It is one beset with difficulties, and there is no subject on which a memorandum issued by the Department will be more welcome or more valuable. The practicable range and method of study, the facilities for study, its precise purpose and educative value, its relations to the other subjects of instruction, the specific attainments of the teachers, are all points which present difficulty and have produced much diversity of method, practice, and performance.

Mr. Robertson, H.M. Chief Inspector, thus reports:—

"The confused state of Nature Study, alike in its methods and aims, has again to be noted with regret. Perhaps the best feature of any little advance that has been made during the past year has been the growing emancipation from the idea that this study is necessarily of a botanical or horticultural type. Schools by the sea-shore (only a very few as yet) have taken to study the wonderland at their doors; and I am glad to report that an interest in school gardening, both for its practical utility and as an auxiliary of Nature Study, is very likely to spread. It is a subject much talked about at present, and its reasonable claims are admitted. At the suggestion of the County Committees of Ross and Inverness the resident lecturer from the College of Agriculture, Aberdeen, is giving careful attention to the early stages of this development in the Rural School scheme of work."

Improved Conceptions.

School Gardening.

With regard to School Gardens Mr. Munro has some useful observations and suggestions. He says:—

"Still another outlet would be the establishment of school gardens or even agricultural plots. One or two cases of these exist already, and have this much to say in their favour, that they are at least well meant and give promise. The essential feature of these plots would be the teaching of principles, not merely the successful growing of farm crops or of garden flowers. The means employed to bring the soil into good physical condition, the symptoms indicative of right or wrong chemical condition, the conditions for germination, the nature of propagation by cuttings or even by grafts and buds might all be included. If the plots were large enough and once fairly established, the handling of the tools by both boys and girls would be at once an excellent branch of manual instruction and good physical exercise."

Educational Effect and Nature of Study.

Inadequate Knowledge of the Subject. Its correction.

Mr. McKechnie refers to the fact that many teachers have a very limited knowledge of Natural Science. Fortunately the institution of Article 55 classes by Provincial Committees, and more isolated action by Colleges and School Boards, are providing teachers with facilities for acquiring a knowledge of various branches of Natural Science which must greatly increase the efficiency of the instruction. The Dundee University College, for example, has taken a prominent part in this work, and, as Mr. Munro mentions, now that out-of-door work has ceased, lectures are given on certain branches of study which can be conveniently dealt with indoors, as, for example, shells.

Action of Dundee University College.

Action of Forfar School Board.

The Forfar Burgh School Board started a Nature Study class two years ago for the benefit of their own teachers; during last session the enrolment was 32, while the character of the work and the enthusiasm of the teachers were deserving of hearty

commendation. The Dundee School Board also has a standing order with florists in town for a regular supply of flowers for study in school.

Mr. Munro refers to the success which is attending this branch of instruction in the Infant Schools. He says :— Nature-Study in the Infant Room.

"One sets up an aquarium, another quite a window garden, in which beans, grain and flax, not to speak of orange seeds, are germinated and grown, while flowers and fruits in profusion, occasionally even fish and game from the poultry shops, are under review, and in many cases not only drawn, but even modelled in clay."

On the same subject of Nature Study Mr. Ewen makes the following instructive observations :—

"In a number of schools where the Nature Study syllabus has been well systematised in the younger classes, a continuation of this Nature Study work, but on more intensive lines, is included in the Experimental Science scheme, and carried on for a short period in each year of the Higher Grade course, usually in the summer months. The extension of this system, which must of necessity be based upon a carefully organised scheme of Nature Study in the Elementary School, is highly desirable. Relation of Nature Study to Experimental Science.

The institution of such excellent classes for teachers, in methods of Nature Study, as those so ably conducted by Professor J. Arthur Thomson for the benefit of the Aberdeen teachers, and by a group of naturalists from St. Andrews and Dundee for the benefit of the Forfarshire and Dundee teachers, should do much to improve matters in this direction. Despite a most unfavourable season, these classes have been largely attended, evoking much enthusiasm ; and it is to be hoped that the Aberdeen and St. Andrews Provincial Committees, which have been responsible for their maintenance, will be able to see their way to increase the number of such classes and extend their influence throughout these provinces. Teachers' Classes.

"The establishment of school gardens in the divisions is now beginning to demand the attention of school authorities and others interested in the development of education on its more practical side ; and although little more than a start has been made so far as actual gardening work by the scholars themselves is concerned, much earnest attention is now being devoted by agricultural and horticultural experts, landowners, and others skilled in rural pursuits, to devise ways and means of establishing and equipping school gardens on thoroughly practical lines, so that the scholars may be able to derive the maximum of educational benefit from them. The school gardens which have been established at Aberdeen Grammar School, Dingwall Academy, Lochee Ancrum Road P. School, Carmyllie (East) P. School, Grange Crossroads P. School, Croy Clava P. School, and several other schools in the division, are already showing how much can be done in this direction." School Gardens.

G.—Physical Drill.

In very many schools physical drill is far from being effective. One reason for this is the lack of a central hall. Physical exercises in the open air are no doubt preferable ; if performed in a deoxygenated atmosphere they are more likely to have an exhausting than a tonic effect ; but the weather conditions are frequently unfavourable. Another reason is a failure to realise the essential purpose and scope of physical training, as designed to produce the harmonious development of the entire muscular system. The instructor's aim formerly was mainly confined to the development of muscular strength and suppleness in the limbs. With this physical training military drill was generally combined. The benefits were incontestable, but perhaps to a greater extent Defects and their Causes.

as favourably affecting the general discipline than as promoting physical efficiency. It is significant of the modern tendency in this direction that the use of the piano in connection with physical drill is becoming discredited, and this not without good cause. The musical accompaniment maintained, it is true, the proper rhythm of movement, but tended to have a distracting and even, one had ground for thinking, a lethargising effect. In far too many instances the exercises were very languid performances, destitute of conviction or concentration of effort. In order to secure the maximum of benefit from the modern methods the instructors must evidently possess a scientific knowledge of the subject adequate for school purposes; teachers must be taught to conduct the various exercises with rational conceptions of their purpose and effect, while at the same time medical advice may often be needed in order to determine the extent to which children organically delicate or unsound may safely be subjected to this discipline.

Some interesting remarks by Mr Wattie may be subjoined. He says:—

Action of Dundee School Board.

"In previous reports reference was made to the appointment two years ago by the Dundee School Board of an expert lady superintendent to supervise the instruction in physical exercises and to a similar appointment last year of a male expert instructor by the managers of the voluntary schools. Both have been devoting a large part of their time to visiting the schools for the purpose of advising the teachers and suggesting courses of exercises for the various classes, as well as conducting classes occasionally themselves, both for the benefit of the children and the information of the teachers. At the beginning of last session a further step was taken by the institution of classes under Article 55. In the case of the public school teachers a beginning was made with the infant division teachers, and short courses were given to 57 of these in three separate classes. At the classes for the voluntary teachers the enrolment was 62, and in 22 cases certificates of efficiency were granted. These classes are to be continued during the current session.

Need of Increased Knowledge of Aims and Methods.

"In the rural part of the district, while the teachers are honestly endeavouring to carry out the physical instruction on the lines of the new syllabus, there is much need for more enlightenment both as to the general aim and as to the particular purposes intended to be served by the various movements and the most helpful methods of executing them. Hitherto there has been no adequate machinery available, but it may be confidently expected that the work will before long be taken in hand by the Provincial Committee."

H.—Supplementary Classes.

Proper Age of Admission.

Article 29 of the Code contemplates the normal transference of pupils from the senior to the supplementary division of the school at the age of 12; and while a reasonable degree of allowance may fitly be made for exceptional circumstances, such as ill-health, delicacy, tardy mental development, unavoidable lateness in coming to school, and the like, it cannot be said that the qualifying examination under Article 29 is unduly difficult for a child of 12 years of age. That examination may be said to represent a stage of attainment intermediate between the old fifth and sixth Standards, and hosts of children left school at the age of 11 after passing the fifth Standard, when it was the standard of exemption. Unfortunately, however, the state of

matters now prevalent is such that a very large number of children leave school without entering the supplementary division at all, and many enter it only to leave it after a comparatively short interval. To put the case succinctly, the number of "over-age" children is disappointingly large, and such a grave educational problem urgently demands investigation. "Over-age" Children.

It may be well at the outset to give an illustration of the state of matters such as that furnished by Mr. Wattie with reference to Dundee. I quote his report in full, as the facts which he adduces are deeply significant :—

"Last report contained some remarks on the large proportion of over-age children in the Dundee schools, due in great measure to late enrolment and in a less degree to sickness and insufficiency of accommodation, and an indication was given of the disastrous effects at the later stages of the children's career. The following table contains a summary of the statistics given in the Forms 61 regarding the stage of advancement reached by the pupils who left the day school finally during the year, having either attained the age of fourteen or having been granted exemption by the School Boards :— Large Proportion of "Over-age" Children.

	At date of leaving in			Totals.
	S. C. Department	Senior Division	Junior Division	
Dundee Public Schools -	1,012	746	98	1,856
Dundee Voluntary Schools -	140	373*	44	557
Schools outside Dundee -	445	321	6	772
Totals - - -	1,597	1,440	148	3,185
		1588		

"From this table it is apparent that, so far from its being the normal condition of affairs that the children receive that course of supplementary instruction which it is the desire and intention of the legislature that they should all enjoy, one half of the children in this district finish their education without attaining to the standard of advancement necessary for entering on the supplementary course ; while a sensible proportion of the children leave school and enter on the business of life with the meagre intellectual equipment contained in the curriculum of the infant and junior divisions. The number of Merit Certificates recommended during the year was 711, so that more than half the children who succeed in reaching the supplementary department leave school without completing a year's attendance, while of those who leave school finally less than one-fourth have finished the full elementary course. The bearing on this over-age problem of the fact that during last session 592 children were refused admission to the Dundee public schools will be at once evident. Educational Effects. Merit Certificate.

"The modified and truncated measure of success which is thus seen to attend the work which our elementary schools are expected to do of training for manhood and citizenship the great mass of our children is undoubtedly

*In regard to the figures for the Voluntary Schools it has to be explained that the number in the senior division includes a considerable proportion of pupils in attendance at the half-time schools at the date of leaving, some of whom may have previously qualified for supplementary enrolment.

the most disquieting feature of our educational system, and the realization of the above figures in their full significance ought to be attended with anxious searchings of heart on the part of all who are interested directly or indirectly in educational progress. That progress is being made is certain, but it is eminently desirable that the pace be accelerated, and for this acceleration more and better accommodation, earlier enrolment, and more regular attendance are essential requisites".

Conditions of greater progress.

That late enrolment is one of the factors of the "over-age" problem is certain; but there is no close or intrinsic relation between the two facts. Children of five or six become habituated to the school atmosphere indeed, but their positive mental acquisitions are at this early stage very slight, and an unjaded mind of seven could as a rule easily make up leeway; but unfortunately the pestilent idea still prevails—an inheritance of the old standard system—that a child must remain for a year in the class which he has entered; he proceeds from class to class automatically from year to year, and hence his admission to a supplementary class is retarded. If a system of promotion and partial re-classification were adopted and took effect at definite intervals there would be fewer "over-age" children. Nor is this the only way in which the old standard system dominates the situation. The requirements for the qualifying examination are interpreted in the light, or perhaps I should say the "darkness visible," of that system. The postponement of a knowledge of vulgar and decimal fractions and of free composition, as presumably a more advanced exercise than the reproduction of a story, is traceable to the old standard requirements. And perhaps I may be permitted to express my opinion that the standard system will continue to act as a "veiled prophet" until a syllabus of work or rubric of instruction is sketched in the spirit of the Memoranda for the several divisions of the school.

Effect of "Standard" System still operating.

But even a rational interpretation of the requirements for the qualifying examination will be of little avail until the supplementary course itself is made more real and intensive. In the larger centres, indeed this has already been done to a very considerable extent; distinctive courses of instruction have been instituted, and their relation to the senior division of the school is as clearly defined as the relation of a Higher Grade Department to the supplementary course itself; but in very many of the smaller schools the supplementary course means little more than the old Standard VI or ex-VI profession, and liberal grants are paid for work which is not really appreciably differentiated from the work of the senior division. As a result the pupils for a year or a year and a half, between the ages of 12 and 14, are for the most part merely marking time; their studies do not excite interest or impress their imagination, and, worst of all, have little concrete application to their future activities. It is to be feared also that many teachers, having to deal with over-age pupils who will soon leave school, share their pupils' sense of the unreality and ephemeral character of the supplementary class work.

Necessity for Practical Work in the Supplementary Course.

In the Northern Division the state of matters, though ostensibly better, is often actually worse. Certain selected pupils between the ages of 12 and 14 receive instruction in Secondary

subjects, but the residuum, it is to be feared, are even more neglected than elsewhere, because the teacher has proportionally less time to devote to them. And, even if some of those pupils who intend to leave school at 14 receive instruction in Latin and French, it is very questionable whether the attenuated tincture of scholarship thus acquired is of much real value. Undue Prominence of Secondary Subjects.

Speaking on my own personal responsibility I would suggest as remedies for the present unsatisfactory state of matters, first, the thorough-going adoption of the principle of promotion; second, a rubric of instruction based upon the memoranda for the several divisions of the school, and, third, the obligatory inclusion in the supplementary course of some form of practical work, as for example, woodwork for the boys and cookery for the girls. Most inspectors have experience of schools here and there—sometimes even small rural schools—where this has already been done, and where the initial difficulties have been successfully overcome by the sympathetic co-operation of managers and teachers. Remedies Suggested.

My colleagues speak in generally favourable terms of the increasing development of supplementary courses in their respective districts.

Mr. Wattie reports that the number of these courses continues to grow. In Dundee the new supplementary school will be ready for occupancy by the beginning of next session. Of the 51 schools in the district 31 are provided with a supplementary course; and probably this number will not be much exceeded. The average attendance in these courses has risen from 1,568 to 1,978, representing a percentage of 5·7 relative to the total average. Even if we allow for the transference of a considerable number of pupils to Secondary and Higher Grade Schools, this percentage ought to be considerably larger. Mr. Wattie's District.

Mr. Macdonald reports that these courses are now pretty general in his district, and he notes with satisfaction that they have been instituted at several Higher Grade Schools as an alternative to the Intermediate Certificate Course. He thinks that they tend to retain children longer at school. Mr. Macdonald's District.

Mr. Philip furnishes me with valuable information on the subject. In the County of Aberdeen there are in all 248 separate Schools, 14 of which cannot have a supplementary course in consequence of the grading principle to which they are subjected; of the remaining 234, there are 191 schools with a supplementary course. Mr. Philip very justly remarks:— Mr. Philip's District.

> "A country school which never presents pupils for qualification on Form 62 (*a*) cannot be regarded as providing efficient instruction. . . . There are Schools in this district which are very small, and where one does not expect promotions to Supplementary Class work every year; but even in the smallest schools, which are not within reach of a centre, when the age of the pupil warrants it, he should in normal circumstances be found engaged in Supplementary Class work."

In Kincardineshire, with 52 schools 45 have Supplementary courses—a satisfactory state of matters Kincardineshire.

Orkney. In Orkney, out of 58 schools 45 have provision for Supplementary Class work. I agree with Mr. Philip in thinking that there ought to be a Supplementary Course in Kirkwall Higher Grade P. School.

Shetland. In Shetland the corresponding figures are 47 out of 64.

Aberdeen City. Naturally, however, it is in Aberdeen City where the greatest expansion of Supplementary Class work has taken place. All of the city schools except three have such courses. The equipment for practical work under Schedule VI. is highly satisfactory.

General Equipment. For the subjects embraced in Schedule V. the necessary material is provided; but the books of reference, intended for the use of the pupils, are sometimes jealously locked up in the headmaster's room.

Taken in connection with Mr. Wattie's information regarding his district Mr. Philip's statement is interesting and suggestive. It appears that out of an average attendance of roughly 23,000 there were 1,601 pupils, or 7 per cent., who qualified for admision to a supplementary course. This is certainly better than Dundee, but by no means a brilliant achievement. There are courses at all the Elementary Voluntary Schools; and the School Board very public-spiritedly affords facilities to the supplementary classes in these schools for obtaining practical instruction.

Practical Work: Woodwork. There is one point in connection with practical work which is often ignored. Woodwork implies much more than the manipulation of tools and the production of certain shapes: it includes drawing to scale and the exact reproduction of arithmetical and geometrical relations. It has therefore the closest relation to Geometry as taught according to modern methods. Mr. Philip reports that in many schools this preparatory discipline is very effectively carried out. The same general principle holds goodas regards land-measurement in the rural school. He states that

Cookery. Cookery was taught last session in only ten centres in that part of Aberdeenshire outside the city, while Woodwork is even rarer. The results in Kincardineshire are relatively much better—Cookery was taught in four schools, and Woodwork in eight. In Orkney and Shetland these subjects are non-existent, except in Lerwick Central School.

Mr. Wattie gives the following information:—

Dundee: Continuity of Instruction. "In last report reference was made to the hiatus existing in most of the Dundee schools between the occupations of the Infant Division and the woodwork of the Supplementary Course. With a view to the filling up of this gap a series of classes was held last session under the Provincial Committee and the School Board for the instruction of teachers in woodwork and cardboard modelling. The numbers enrolled were 21 and 92 respectively. With the commencement of the present session all the public

Training of Teachers in the Subject. schools in Dundee have made arrangements for this completion of the manual curriculum. The intention of the Board was, I understand, to institute a continuous course of hand-and-eye training for the boys parallel to the girls' sewing."

Correlation of Manual Instruction with other Subjects. On the relation between Manual Instruction and other subjects in the school curriculum Mr Ewen has the following remarks:—

"The educational value of Manual Instruction and other practical subjects

as integral parts of the curricula of Higher Grade and Secondary Schools, as well as in Supplementary Courses, is being increasingly recognised, and a considerable number of schools in the Divisions are now being provided with well-equipped workshops and premises for the teaching of Cookery and Laundry Work. In schools where Manual Instruction is included in the boys' curriculum, a careful correlation between this work and the Experimental Science and other instruction should always be aimed at. In a number of cases this has been well secured, and the boys have constructed in the workshop pieces of apparatus which they have afterwards been able to use in connection with their experimental work in the science laboratory, with very good educational results. Apparatus, instruments, and tools, for use in connection with Nature Study, Practical Geography, and School Gardening, have also been designed and made under the Manual Instruction syllabus. In other cases the workshop provides for the carrying out of original designs planned by the boys in connection with their Art studies. Such effective and valuable correlations as these should receive every encouragement. Accuracy and neatness in the drawings as well as in the articles constructed, is very properly regarded as of the greatest importance."

Correlation of Cookery with other Subjects.

Cookery, likewise, when intelligently taught can be brought into connection with elementary principles and phenomena in Physics, Chemistry, and Physiology which would serve to place culinary operations upon a rational basis, and so prevent much random work and waste of good materials in domestic life. Some of us have had the privilege of being present at Cookery Demonstration lessons which, in their constant reference to underlying principles, had all the interest, and probably more than the frequently ephemeral benefit, of popular lectures on Science.

On the entire subject of Cookery and Laundry Work in the Northern and Highland Divisions I beg to subjoin Miss Crawford's full and valuable report.

During the year an endeavour was made to visit any hitherto unvisited class or centre, and, so far as I am aware, this object has been accomplished.

In all 57 classes were seen, 11 of which were taught by one of the staff teachers of the school.

Progress.

The general progress of the work throughout the division has been uniformly satisfactory. As Cookery is now becoming more and more recognised as a branch of the supplementary course for girls, the subject is being introduced to an increasing extent. In many schools, however, the want of suitable accommodation, or the financial and other difficulties incurred in securing a teacher, are the chief obstacles to its introduction. In rural and isolated districts particularly, it is only possible to have the work undertaken by one of the staff, and the necessity, therefore, for including this subject in the curriculum of students' training as supplementary-class teachers becomes urgent.

Obstacles to Success.

The quality of the work varies considerably. Lack of more frequent inspection, the isolation of the cookery teacher, the temptation to make the classes pay by cooking what will sell to most advantage, the unsuitable class rooms and inadequate stove accommodation are the main causes of slip-shod and faulty work. The individual reports issued after each visit of inspection reveal, however, that in the majority of cases the work is distinctly commendable and of a high standard.

Syllabus of Work.

The syllabuses of work have been much improved within recent years. In framing these the teachers as a rule endeavour to include all the primary methods of cookery, with dishes of an appropriate and useful nature to illustrate them. Occasionally an uncalled-for departure from the syllabus is discovered and therefore discouraged, for in this as in other forms of school work the less divergence there is from the approved course of instruction the more satisfactory record of work will be accomplished during the session.

Demonstration Lessons.

The abolition of large classes for demonstration lessons is much to be desired. There is no good reason why pupils should be gathered in large battalions of 54, and surely the mere question of money should not be made the barrier to effective teaching. Teaching by demonstration is useful, but of much greater value is the teaching by demonstration and practice on the part of the pupil combined. It is hardly possible to keep a large class of pupils of the age of 12 interested for a period of two hours, especially if the majority of these pupils are so seated that they can see but few of the operations of the demonstrator.

Position of Cookery in Higher Grade Schools.

During the past year Cookery has been introduced into the curriculum of many of the Higher Grade Schools, while in others it has been dropped or assigned to a very small proportion of the pupils. If every girl pupil of the Higher Grade School were being trained to enter the teaching profession, there would be some reason for thus cutting out the subject; but it is evident that many will never be able to adopt this career, but will complete their education at the age of 15 or 16. It is a severe handicap to these girls, therefore, if at this age, when they turn to earn their own livelihood, they find themselves possessed of no real knowledge of any branch of home management.

In Aberdeenshire a splendidly equipped class-room has recently been added to Kemnay Higher Grade Public School, and a teacher of Cookery has been appointed for the work. At Turriff Higher Grade Public School also a new class-room has just been erected, and arrangements have been completed for beginning the work. The subject is also taught with much success at Inverurie Higher Grade Public School and at Peterhead Academy.

Domestic Subjects in General.

Special mention is again made of the continued success and popularity of the domestic subjects, including, in addition to Cookery, Housewifery and Dressmaking, taught at Huntly Gordon Schools. Many of the finished garments in the last subject were excellent specimens of neatness and thoroughness in every detail.

A most promising class was seen at Fyvie Girls' School, and it is hoped that suitable accommodation will here be provided for the future development of this subject, in every respect specially applicable to the school.

Cookery as taught in Aberdeen City Schools

In Aberdeen City, instruction is given to the pupils of all the Elementary Schools and to a few of the pupils of the Central Higher Grade Public School. The work in progress throughout the city is generally satisfactory, though in regard to its nature and quality it varies considerably. In some cases little attention is paid to the actual teaching of the subject by practical and approved methods, while in other cases the amount of food material provided for practice is far too limited. More attention might also be given to the choice of dishes to be practised, avoiding as far as possible those of the cake and pastry nature, and choosing in preference those common to the majority of homes. Much of the teaching, however, was excellent, the educative as well as the useful aspect of the subject being kept in view.

Suggestions for its Improvement.

Cookery Classes in Dundee

In Forfarshire, Dundee claims the largest number of classes. The work here is carried on by a staff of specially qualified teachers, and during the year it has been a pleasure to testify to the continued generally satisfactory nature of the instruction and to the enthusiasm displayed by many of these capable instructresses. The class for deaf and dumb pupils, also those for half-time pupils, well justify their existence. The work of the former compares favourably with that of ordinary pupils; while for the latter surely no training is better calculated to compensate for the lack of home influence and training, and to enable these girls to develop into healthy and capable women. The Board wisely entrust these classes to some of their most experienced and competent staff, and the advisability of continuing or extending the work in these directions cannot be too strongly urged.

In the County.

At Broughty Ferry the subject continues to be taught in the kitchen attached to the Grove Academy, while at Arbroath, Montrose, and Brechin specially equipped centres have been erected where the work is conducted on home-like principles and with much success.

Throughout this county few additional classes have been notified during the year. The want of certificated teachers qualified to teach the subject prevents many Boards from undertaking it, the small number of pupils

eligible for instruction scarcely justifying the employment of a specialist. This difficulty, however, should soon disappear, if Cookery is included in the training of students preparing for Supplementary work.

Kincardineshire. In Kincardineshire good work is carried on at Stonehaven Mackie Academy, also at Laurencekirk Public School.

Orkney and Shetland still await a visit of inspection.

Elgin. In the county of Elgin the Elgin Girls' Technical School maintains a leading place in the North. Here the training in domestic subjects is made of real interest, and, in the hands of a trained and experienced teacher, is rendered a means whereby the pupil's powers of observation and manipulation are developed in the best possible manner.

At Forres Higher Grade Public School, and at Lossiemouth Public School, the subject is taught by a member of the staff; and at Alves, Hopeman, and throughout this district generally, classes have been in operation for a number of years and have been conducted with much efficiency and success.

Nairn. At Nairn Public Schools ordinary classrooms have been utilized for Cookery, which though not an ideal arrangement, has enabled the work to be continued. When the proposed new school with its properly equipped domestic classrooms is available, it is anticipated that the lessons will extend throughout the whole session, and that an extension will be made in the direction of instituting day classes under the Continuation Code for pupils from the country and adjacent districts.

Inverness. Inverness Technical School maintains a high standard of efficiency. The pupils from all the schools in the Burgh attend in detachments, and pursue a systematic course of two or three years' instruction. The Board of this Burgh has deemed it advisable to recommend that all girls of the age of 12, irrespective of class attainment, receive a course of training in Cookery. The recommendation is commendable and worthy of being adopted by other Boards. Many girls from various causes may never reach a Supplementary Class, and to this type of pupil a training in handwork is much to be desired and may prove a means whereby these girls will more willingly and intelligently adopt the career of domestic employment.

At Glen Urquhart and Kingussie Higher Grade Public Schools the subject is very ably taught by a member of the staff, though in the latter school a larger percentage of the pupils might reasonably be expected to share in the course of instruction.

Inverness (Landward) Board has many interesting and successful classes conducted by the certificated teacher. The lack of qualified teachers excludes the teaching of Cookery from many schools eager to adopt it, and, as soon as this want is supplied, the subject promises to become still more universally taught throughout the rural districts of the county.

Laundry Work. In the cities and large towns of this Division, where centres are provided for the teaching of domestic subjects, Laundry Work is invariably included. In many cases the lessons alternate with those in Cookery; while in others they are given after the first Cookery course has been completed, and during a portion of the year only.

Proper Age for this Subject. The subject is not recommended for young girls, but for pupils after they have spent at least six months in the Cookery class. At this stage they are better accustomed to handle things, and the work proves less laborious and physically irksome to them. As these classes are, or should be, of a wholly practical nature, it is advisable to restrict the numbers to 12 or 16. If the latter number is exceeded, it becomes difficult for the teacher to give the due share of attention to individual pupils which the nature of the work demands.

Appliances Required. For lessons in the washing of clothes care should be taken to provide each pupil with a tub or basin. Where this precaution has not been taken, serious objections have been raised by parents, and pupils have been withdrawn from the classes. In fitting up a laundry classroom the tubs should not be fixed against the wall, but brought out, leaving sufficient space between the wall and tubs for a passage. This arrangement allows the teacher to command an uninterrupted view of her pupils while they are working at the tubs, and enables her also to supervise and control the work with more efficiency and care.

Ironing.

For lessons in ironing it is good to have a supply of cast off garments for pupils to practise on before attempting the dressing of better garments brought from home. The dressing of lace, silk, and other easily manipulated garments is always enjoyed by the pupils, and, if only a little can be attempted in the dressing of collars and garments reserved for the expert, surely the lessons are of some practical benefit, if for no other reason than creating the desire for and means to secure clean and well dressed articles of clothing.

Laundry Work is a useful subject for every girl, and the knowledge and manipulative skill acquired during a course of lessons never come amiss.

I. Drawing.

Drawing. Mr. Ewen.

Mr. Ewen introduces Mr. Hood's report with the following observations:—

"The teaching of Drawing in its various branches, especially in the Primary School, is fully dealt with in Mr. Hood's report. In the Higher Grade Schools and Junior Student Centres too, great progress is evident, and a considerable number of the larger schools are now being provided with special Art Rooms, well equipped and furnished, in which the subject can be adequately treated. Where such provision is made, and the Drawing instruction is properly organized, the Art Room should naturally become the æsthetic centre of the school, radiating its influence throughout all the other branches of the work.

The publication of the Department's Memorandum on the Teaching of Drawing has been of service to a number of schools in indicating methods of treatment and possible lines of development. In this connection Mr. Hood has already done valuable work by meeting groups of teachers at convenient centres, principally in the Highland Division, and expounding and illustrating to them the principles laid down in the Memorandum. These meetings afford valuable opportunities also for the discussion of points of interest connected with the school Drawing scheme, and for clearing away difficulties which arise in the carrying of it out. This system of conference and discussion has been greatly appreciated by the teachers, and its extension would be heartily welcomed."

Mr. Hood's report is as follows:—

Nature Drawing.

"During the session I devoted my attention to the following counties, viz., Aberdeen, Inverness, Ross, Nairn, Moray, Banff, and Caithness.

"Nature drawing continues to make steady progress. The important points in a flower, leaf, or spray, are carefully noted and expressed in a more definite and a more natural manner than hitherto. The principal difficulty the pupil finds in representing actual things lies in the expression of their surfaces or textures, such as the shiny surface of a flower or leaf, the polish of certain shells; or the opposite of that, such as the roughness of the bark of stems, &c. In many cases all such objects appear as if made of one common material, and this produces an unpleasantly false feeling.

"In connection with this branch of the work, the pupil frequently fails to produce a satisfactory drawing through the heat of the hand causing the flower or spray to fade and droop. That is very disappointing to everyone concerned. The introduction of a simple stand with a tube for water, and a device for holding a background in position, will obviate the difficulty, and will tend considerably to improve the work as a whole.

Object Drawing.

"Object drawing receives careful attention in all the schools in the Division. The exercises are selected to suit the pupils at the different stages of advancement, and are graded as regards difficulty and continuity of type.

"At this point another difficulty arises, which requires as much attention as the selection and arrangement of objects, namely, the proper setting up of the exercises before the class. As these objects are not supposed to be suspended in space, in putting them up something must be placed under them by way of ground. The ground may be light, medium, or dark, but in the early stages the surface should be of one uniform colour and not polished. The colour of the background should be frequently changed, and the same object should be set before different backgrounds and the different effects carefully noted. In the early stages the exercise may be an object placed in relation to a background only, such as a slate, a school-bag, or anything of that type, hanging from a nail in the wall, or hanging in relation to a background of any desired colour. As the pupils acquire skill and facility in execution, the difficulty of the exercise can be increased in accordance with their capacity.

Arrangement of objects. Foreground. Background.

"The suggestions in last report on shading in black and white are being adopted in a number of cases with success.

Shading in Black and White.

"Here I may add, however, that the lines used in shading with the lead pencil should vary according to the form and texture of the object to be represented: rounded forms are best represented by curved lines, while straight lines are used for flat surfaces, aiding by their direction the perspective changes of the form. The regularity of the lines and their equality in tone must be strictly adhered to: one of the lines either darker or more unequal than another disturbs the eye and destroys the effect of continuity.

"In order to study the effects of light and shade which belong to an object or group of objects, as distinguished from those which are produced by reflection, before beginning to work, a precaution is necessary, namely, to remove to a distance all objects that will either intercept the light from the object, or cast reflections upon it. The representation may then be attempted, and may be easily expressed with colours; but with pencil it is different. The effect has to be rendered by means of light and shade only, and the pupils must endeavour in looking at the object to separate these from colour.

Effects of Light and Shade.

"The form of any object with its light and shade, texture of material, whether smooth or glossy, rough or shaggy, can be satisfactorily represented by the lead pencil; but we must depend on colour for the highest results of artistic expression; the pencil must be the means and not the end of our studies.

The Pencil.

"The brush is gaining in popularity as a means of expression, and there is promise of satisfactory results in schools where colour-work is taken up in a systematic fashion. The pupils first get a knowledge of the primary colours the mixing of these to produce the secondaries, and then the tertiaries.

The Brush.

"Design is attempted in the higher classes of a number of schools. Referring to the work generally it is satisfactory to find that the execution is much better than in previous years. Proportions are carefully observed, drawing is firmer, and the colour is cleaner and more harmonious.

Design.

"*Clay-modelling.*—As a rule the exercises show that the medium is understood and appreciated, and that the pupils are steadily acquiring skill in the manipulation of clay.

Clay-modelling.

"*Drawing to Scale.*—This branch of the work continues to flourish. Pupils are taught to draw objects to different scales and to represent them to scale in plan and elevation."

Drawing to Scale.

Mr. Hood supplies some information on Woodwork which for convenience may be set down here :—

"Woodwork is taught at a number of centres, such as Aberdeen and Inverness. At the present time there is an interesting development at the Inverness centre, which is best described in the words of Mr. Stewart, the able instructor :—'Manual Instruction in this school is correlated with Experimental Science in an effective manner by the calculating, drawing, constructing, and subsequent testing by monochord of a scale of organ pipes executed by the boys in wood and in metal. The pipes lend themselves to several interesting experiments in sound: these are carefully carried out by the pupils in their Science classes.'"

Woodwork

J.—Higher Grade Schools.

Increase in their Number.

During the past Session there has been a considerable increase of the number of these schools in the Northern Division; but there is, I think, no indication of a tendency unduly to multiply them. On the contrary, there are still a few localities where a Higher Grade School might appropriately be established. The ideal of attainment is to have such schools so distributed that an opportunity of obtaining secondary instruction may be available without serious difficulty or inconvenience. The problem is not unfrequently somewhat complicated. There may, for example, be railway communication linking certain localities with a fair degree of directness; but in not a few instances the morning and afternoon service of trains may be such that school children must leave their homes very early in the morning and will be unable to return home till late in the evening. Apart from other inconveniences, such a condition of matters seriously limits the amount of time available for private study. Even if we admit that home-lessons are frequently overdone, it is nevertheless necessary that the pupils should perform subsidiary work for which the school sederunt does not supply an adequate opportunity. Another complication arises from the educational traditions which have long obtained in the Northern Division. Under the influence of the Dick and Milne Bequests a considerable amount of secondary work has been done in many of the Primary Schools; and there is a tendency, on the one hand, to desire the inclusion of such schools within the scope of the new system, and, on the other, to regard the secondary instruction thus given as sufficient for higher education in general. As regards the latter point it is evident enough that no Primary School can effectively compete with a Higher Grade School properly equipped and adequately provided with a specially qualified staff; and the attempt to do secondary work is exceedingly apt to conflict with the requirements of a Supplementary Course. The inevitable result is that the teacher is apt to concentrate his efforts upon those who are receiving secondary instruction to the detriment of those who are likely to leave school at fourteen. The policy of the Department is, however, quite clear, and meets all reasonable requirements. Higher Grade Schools should be distributed as widely as possible, having regard to the requirement that each of these Schools shall possess the full equipment necessary and shall have a sufficient staff of specially qualified teachers to permit of separate instruction being given to the pupils of each year on a minimum course of three years. But it is the duty of the principal teachers of all other schools, without professing to give in every case a complete course of intermediate education, to do what they can to pick out pupils of special capacity in these schools and to give them what instruction in Secondary subjects the circumstances of the school admit of, with a view to preparing them for taking up the work of the recognised Higher Grade or Secondary School at such stage of the course—

Difficulties.

Railway Service.

Educational Tradition.

Co-existence of Supplementary Course.

Requirements for H.G. Schools.

Preparatory higher instruction in the Primary School.

beginning, end of 1st year, or (in exceptional circumstances) at the end of the 2nd year—as the distance from the Central School and the abundance or scantiness of the provision of bursaries may suggest. In order that pupils so transferred should be able to take their place in the Higher Grade School without loss of time, it is highly desirable that as many of the ordinary schools as possible should possess the very simple equipment required for the instruction of 2 or 3 pupils at a time in Experimental Science.

The teaching of Science in the Primary School.

The nature and extent of this provision are in the case of such schools not unduly exacting; but it would be a disastrous mistake to make it a *pro forma* requirement. Science teaching must be a reality, must be based upon a well-considered scheme, and must not be merely a series of *dilettante* and more or less spectacular experiments, such as often passed for science teaching in former days. The teachers also must qualify themselves for the giving of science teaching on modern lines; and it is my pleasing duty to report that they are displaying an altogether admirable degree of zeal, self-abnegation, and even enthusiasm in attending Article 55 classes or Technical College classes for the purpose of acquiring the necessary expertness in the practical treatment of the subject. As they are generally graduates, they already possess a knowledge of its more theoretic aspects.

Relation of H.G. Department to Supplementary Course.

One very difficult subject is the relation of the Supplementary Course to the Higher Grade department or to the Intermediate Curriculum. In large Higher Grade Schools the differentiation is usually complete, it is in the smaller schools that the difficulty emerges. When the number of pupils between twelve and fourteen does not exceed thirty, and is under the charge of a single teacher, it is very difficult, if not almost impossible, to secure the concurrency of a Secondary with a Supplementary Course of instruction as outlined in Schedule VI. The difficulty is met partly by combining both sets of pupils for certain subjects such as English in its several branches, Arithmetic, etc., and partly by adopting a composite course of Supplementary instruction. Neither arrangement is quite satisfactory, and there is always in such cases a tendency to subordinate, or even to sacrifice, Supplementary to Secondary instruction. It is manifestly almost a breach of faith to retain children at school till the age of fourteen unless provision is made for their receiving distinctive instruction adapted to their special requirements. When, moreover, so many pupils only pass the Qualifying Examination at a comparatively late stage of their school career there is all the greater risk of their being regarded as a negligible quantity, and as too bad for blessing if too good for banning. In the meantime, until the requirements for the Supplementary Course are made more stringently practical and intensive, some mitigation of the evil may be found in more independent study on the part of the

secondary pupils and in quasi-tutorial instruction of these pupils before or after the ordinary school-sederunt, as was the practice in former days.

Remarks upon the instruction in the several subjects of Secondary Education in these Schools will be found in the Secondary Education Report.

I have the honour to be,

My Lords,

Your obedient Servant,

G. DUNN.

To the Right Honourable
The Lords of the Committee of Council
on Education in Scotland.

EDUCATION (SCOTLAND).

WESTERN DIVISION.

GENERAL REPORT FOR THE YEAR 1907,

BY

A. R. ANDREW, Esq., M.A.,

ONE OF HIS MAJESTY'S CHIEF INSPECTORS.

Presented to both Houses of Parliament by Command of His Majesty.

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1908.

[Cd. 4050.]

WESTERN DIVISION.

Comprising the Counties of Argyll, Ayr, Bute, Dumbarton (part of), Dumfries, Inverness (part of), Kirkcudbright, Lanark, Renfrew, Stirling (part of), and Wigtown.

Population - - 2,216,783.

Inspectorial Staff.

1 Chief Inspector.
8 Inspectors.
6 Junior Inspectors.
3 Sub-Inspectors, 1st Class.
9 Sub-Inspectors, 2nd Class

GENERAL REPORT *for the year* 1907 *by* A. R. ANDREW, Esq., M.A., *one of His Majesty's Chief Inspectors, on the* SCHOOLS *in the* WESTERN DIVISION OF SCOTLAND.

Glasgow,

January, 1908.

MY LORDS,

I have the honour to present a General Report on the educational condition of the Western Division during the past year.

Changes of Staff.

Some changes in the Inspectorial Staff of the Division have taken place during the Session. On the transference of H.M. Inspector Mr. J. C. Smith to the Fifeshire District, H.M Inspector Dr. A. D. Thomson took charge of the Glasgow District, and his place in the Dumfries District was taken by H.M. Inspector Mr. D. Thompson. At the same time H.M. Inspector Mr. R. Harvey took charge of the Govan and Dumbarton District, and, in the Lanarkshire District, from which he was transferred, he was succeeded by H.M. Inspector Mr. G. Andrew, who had been for some time associated with him in this District. Mr. Andrew has been assisted by Mr. T. B. M. Lamb, who has, in the course of the year, received well-merited promotion to the rank of H.M. Inspector.

After long and honourable service Mr. J. Binnie, I.S.O., Sub-Inspector, has retired, and his place has been filled by the promotion of Mr. J. Wilson, Sub-Inspector, to the first class, and his transference from the Stirling District to Argyll and Renfrew.

SCHOOL SUPPLY.

Increased accommodation.

In every part of the Western Division the past year has witnessed a considerable increase in School accommodation by the provision of new buildings, and a series of improvements and reconstructions in the case of existing premises.

The ideas governing school architecture have shared in the general educational evolution, and the contrast, in point of convenience, rational arrangement and hygienic fitness, between a modern school and one built thirty years ago is a measure of the advance which has been made.

Modern School-buildings.

The type of building most in favour at present consists of a central hall well lighted from the roof, with staircases at each end leading to the railed galleries from which the classrooms open. The lower floor in many schools is devoted to the Infant

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and Lower Junior Classes, the middle floor to the rest of the Junior Division, and the upper floor to the Senior School. The Cloakrooms and Retiring-rooms are placed on each landing. Even in smaller schools a similar type is found to be most suitable. The new Infant School at Campbeltown is a good instance of such modification of the prevailing form, and the large new school at London Road, recently opened by the School Board of Glasgow, is a complete example of a fully and beautifully equipped modern school building. Under the Govan School Board a splendid new school, specially furnished and equipped for defective children, is nearing completion at Ibrox, and, when it is finished, it will be the best example of its kind, not only in the Western Division, but possibly in the whole of Scotland. The same School Board contemplate the erection of a new school to serve as a centre for Higher Grade work in Fairfield District. This school is specially planned for the purposes of Higher Grade, Continuation, and Technical Instruction; it will be devoted to these purposes only, and will be in every way worthy of the traditions of the Govan Parish School Board.

School furniture.

The improvement noticeable in the internal fittings and furniture of modern schools is not less striking than in the buildings themselves. Instead of long unwieldy desks made with little regard for the comfort of the pupils using them, dual or single desks, adjustable in many ways to the needs and age of the children, are provided. The windows give ample light where it is most required, the walls are bright with pictures, and all the apparatus necessary for instruction is of the best kind.

Schools of the sort described above are costly, but, apart from the fact that everything which tends to minimise the strain of teaching and of learning is a direct gain in economy of power, the unconscious, but far-reaching educational influence of space, light, fresh air, and pleasant physical environment on the pupils themselves is enough to justify the investment.

Provision of new schools in urban areas.

In the City Districts of Glasgow and Govan the provision of new schools is practically a constant factor in the School Board's expenditure. Whether as the result of the trend of population to the suburbs, noted in previous reports, or of the springing up of new industrial districts, these Boards have to face the expenditure involved in building one or more new schools each year. It is greatly to their credit, and deserves the notice and gratitude of the community, that this problem is faced in a spirit of wise economy combined with far-seeing liberality in the provision, without extravagance, of all that is really necessary.

Closing of superfluous Schools.

In last year's Report H.M. Inspector Mr. J. C. Smith remarked on the advisability of closing certain schools, rendered superfluous by the fluctuations of population and other causes in the area of the School Board of Glasgow. Since then three such schools have been closed, and the closing of a fourth is only a question of time.

The statement made last year, as to the need for increasing the school accommodation in the shipbuilding and other industrial districts of Dumbartonshire, has been fully borne out by the opening of two large and very finely equipped schools. New Schools in Dumbartonshire.

The question of new school buildings continues to be a pressing one in Lanarkshire, but Managers are alive to its importance, and considerable progress has been made in meeting urgent requirements. Five new schools have been opened, and, in almost all the larger districts, additional accommodation is either projected or in course of being provided. And Lanarkshire

Four schools have been closed in Ayrshire; for one of them a school under Article 19D. (a) has been substituted, and in another case a new school has been built. The closing of two of these schools has reduced the number of non-Catholic Voluntary Schools in this district to three. Ayrshire.

In the South-Western Section of the Division a similar reduction in the number of Voluntary Schools falls to be noted, three of these schools having passed under the control of School Boards. Dumfries District.

The diversified conditions and wide extent of the Renfrew and Argyll Districts necessarily imply constant change in the amount and quality of the school supply. Here also, there is mention of the closing of old, unsuitable, or superfluous schools, but several new schools have been opened, and a considerable number are in process of erection. The manner in which industrial conditions affect the question of school accommodation is strikingly exemplified in the case of Kinlochleven, which is thus referred to by H.M. Inspector Mr. Munro Fraser:— Renfrew and Argyll.

"The opening of this school deserves more than a passing notice. The necessity for it has arisen from the building of a town (for it is nothing else) to accommodate the workers of the British Aluminium Company. Water-power for the production of the motive force required for the extraction of Aluminium from the substances in which it occurs is found in a chain of lochs in the neighbourhood, in connection with which extensive damming operations are approaching completion. It is calculated that, when things are in full working order, the population of Kinlochleven will amount to 6,000. If the use of Aluminium becomes popular, further advantage may may be taken of the physical features of the Highlands for manufacturing purposes, and a large addition made to the ranks of the industrial classes. The number of children at present on the roll of the school is 70, but that number will soon be largely exceeded."

The statistics of school supply given last year showed that twenty-six schools were then either planned or actually being built, while the figures for this year show that twenty-five new schools have been opened; with one exception, therefore, all the schools projected last year are now actually at work. This year eighteen new schools are still unfinished, but the majority of them will no doubt be in occupation at an early date. Comparison with last year.

Catholic Schools.

The ready response made by the Managers of Catholic Schools to the requirements of their increasing community again deserves hearty recognition. Among others the excellent premises opened at Mossend, Lanarkshire, may be mentioned as an instance of such action.

Extensions and reconstructions.

Throughout the Division a great amount of work has been done in the improvement, extension, and reconstruction of existing schools. Perhaps the most important fact in connection with this aspect of school supply is the number of schools to which additions have been or will be made, for the purposes of Higher Grade instruction. Notably in this connection mention may be made of the addition to Uddingston Grammar School, now completed, and the large addition in process of erection to Bellshill Academy for the purposes of a Junior Student Centre. In some cases, as at Springburn and Lockerbie, the new premises are of a temporary nature, in others they have involved, or will involve, the building of new permanent class-rooms, workshops and laboratories.

Accommodation for practical instruction.

The improvement of accommodation by the provision of greater facilities for practical instruction in connection with Supplementary Courses is a matter which will probably occupy the attention of Managers in many districts in the near future, and in some other respects, perhaps equally important, the reports of the District Inspectors show that the school accommodation of the Division is, notwithstanding the steady and even rapid progress described above, far from complete.

Cloakrooms and desks.

In the Glasgow area for example, cloak-room and desk accommodation in a large number of the older schools are unsatisfactory; wet clothing must be hung up in the school room (see report on School Hygiene), desks have no back supports, and some schools have no hall for physical exercises. The unsuitability of many of the desks in use is also referred to by H.M. Inspector Mr. G. Andrew in his report on the Lanarkshire District; desks without support for the back and desks of unsuitable height may be seriously injurious to the children who use them, and they should be as quickly as possible replaced by more modern furniture. This process of improving the school furniture has already been begun by the School Board of Glasgow, and it will, no doubt, be completed in a reasonable time.

Schools in noisy streets

The position of certain schools in Glasgow in the midst of busy and noisy streets is referred to by H.M. Inspector Dr. A. D. Thomson, who suggests that wood might be substituted for the stone paving which causes so large a part of the intolerable noise.

Other matters connected with school furniture and equipment will be referred to in the section of the Report dealing with School Hygiene.

A summary of the chief facts in regard to the school supply of the Division is given in the statistical table below :—

STATISTICS OF SCHOOL SUPPLY, 1907.

Number of District.	New Schools. (a) Opened.	(b) Building.	(c) Planned.	Extensions and Reconstructions. (a) Opened.	(b) Building.	(c) Planned.	Total.
No. 7. Dr. A. D. Thomson	7	1	2	2	–	–	12
No. 8. Mr. G. Andrew -	5	–	1	1	3	1	11
No. 9. Mr. Lobban -	1	–	-	3	2	6	12
No. 10. Mr. D. Thompson	3	1	1	3	3	–	11
No. 11. Mr. R. Harvey -	4	–	2	3	1	–	10
No. 12. Mr. Munro Fraser	5	7	3	5	–	–	20
Totals - -	25	9	9	17	9	7	76

Attendance and Exemption.

School Attendance Returns Western Division.

The summary of "School Attendance Returns" compiled for office purposes, by the Department brings out several interesting facts concerning the attendance of pupils in the Division. The figures are taken from tables which include pupils in attendance at *all* schools within the county areas, and are therefore applicable not only to Public Schools, Primary and Intermediate, but also to Secondary, Voluntary, and Private Schools.*

* This fact accounts for the difference between the totals given here and those given in the tables appended to the section on Supplementary Courses, which deal with Primary and Intermediate State-aided Schools only; the latter refer to the year ended 31st August, 1907, the former to the year ended 31st December, 1906.

A test of regularity.

The chief element in the statistics by which the regularity of attendance can be gauged is the relation, expressed as a percentage, which obtains between the average number in attendance and the average number on the roll. As the number on the roll of all schools in the Division is 421,978 and the average number of pupils in attendance during the year was 372,647 this percentage is a little over 88, a number which closely approximates to the general percentage for Scotland (88·07).

A comparison with last year.

As compared with last year, the roll of the Division shows an increase of 3,949, the average attendance of 4,955, and the "percentage" of nearly a unit. These facts indicate that the attendance at the schools in the Division has been quite as regular as it is in the country generally, and that it has, on the whole, been considerably more regular than in the previous year. Not only so, but the actual regularity of attendance indicated by the figure 88 must be regarded as very satisfactory, for it means that, all over, only about 12 children in every hundred were absent from school on most days of the year. Since, even in the schools where the attendance is most regular, this number is seldom less than 10, there is much reason for thinking that the increased efforts of school authorities to secure regularity in recent years have not been fruitless.

Attendance in the different counties.

In six of the nine counties composing the Division the average attendance has risen; it has decreased in Bute, Kirkcudbright, and Dumbarton, where in each case there is also a diminished roll. The number on the roll has also fallen in Argyll, but the average attendance and the percentage have both risen—a clear indication that the attendance in this county, where regularity encounters more natural obstacles than anywhere else, has decidedly improved. In only two counties (Dumbarton and Wigtown) is the percentage of regularity less than it was last year. In the former the relative difference is slight, but in the latter the figure of last year, already among the lowest in Scotland, has fallen from 85·34 to 85·13, although there is an increased roll—a disappointing result in view of the emphatic manner in which the attention of the School Authorities of the county has already been drawn to the state of the attendance within their area of jurisdiction. In the two neighbouring counties of Dumfries and Kirkcudbright the corresponding figures are 89·03 and 89·07 respectively, and these figures are not only much higher than in Wigtown, they not only exceed the average for Scotland, and the average for the Division, but they are absolutely the highest among the nine western counties. One has difficulty in believing that there can be anything in the circumstances of the third county in the district to account for this great difference except the cause indicated in last year's Report—the continued apathy and inactivity of the authorities responsible for carrying out the compulsory clauses within this area.

If we analyse the figures for Wigtownshire still further we find that the percentage for the various age groups is as follows:— Attendance in Wigtownshire.

Age.	
5– 7 - - -	81·01.
7–12 - - -	86·78.
12–14 - - -	84·54.
Over 14 - - -	85·61.

The percentage might naturally be expected, in a country district where young children have often to walk long distances to school, to be lowest in the lower age groups, and this is the case in the first group. It might also be expected to be highest in the age group over 14, because those children are in most cases attending Higher Grade or Secondary Schools, and are therefore completing a three or more years' course of Higher Education, but it is a striking fact that in the age groups 7–12 and 12–14, the attendance is 2 per cent. better for the lower than for the higher of the two groups. This entirely bears out the remark made by H.M. Inspector Mr. D. Thompson, that a poor attendance in the higher classes is often masked by a good attendance in the lower part of the school, and it hardly seems an unfair deduction that the irregularity is caused by the unjustifiable withdrawal of the older children for casual employment.

A similar analysis of the numbers in each age group in each county of the Division seems to bear out the following conclusions as to the state of school attendance. Further illustration of these conclusions will be found in the Graphs accompanying this section. General conclusions from the statistics for Age-groups.

1. The children in the lowest age group are the most irregular, the general percentage for this group being 85·1. The figures, however, range from about 81 in Wigtown and Dumbarton to over 88 in Ayrshire; this last percentage shows that Infants in this county attend with great regularity, a fact that may be attributed to the method of shortening the school day largely used in this area. Mr. Lobban refers to this practice in the following terms:—

> "The attractions of the shortened day are having their effect in bringing children to school at a reasonably early age. There has been marked improvement in this direction in recent years, and the majority of the pupils now begin their school life before they reach the age of six.

2. In every county the attendance in the next age group (7–12) is very much better than in the infant group. The average percentage for the group is 89·4–nearly 5 per cent. more than in the group below. Six out of the nine counties approach this figure very closely, those which fall markedly below it being Argyll and Wigtown. This is the group of greatest average regularity in Ayrshire and Wigtownshire only, but in Ayrshire the early

entry of children and their greater regularity in the previous age group are factors which compensate to some extent for a subsequent falling off in the higher groups. In the other counties the attendance as a rule becomes more regular with the increasing age of the pupils.

3. In the third age group (12–14) the regularity of attendance increases as compared with the two lower groups in six of the counties, the exceptions to this rule being Ayr, Wigtown and Lanark. In Ayr and Lanark the difference is slight, but in Wigtown, as has already been indicated, it is considerable. This is the group of children whose attendance is most regular in Bute, Dumfries and Kirkcudbright.

4. The age group of children over 14 attend under different conditions from those below that age: their attendance is not compulsory, they belong in many cases to a different social class from the mass of pupils below that age, and the great majority of them are pupils of Higher Grade, Secondary, or Private Schools. It is natural, therefore, to find that in several counties this is the most regular group of pupils, and that the percentage of this group is on the average the highest. It is 90·8, and this is the most regular age group in Argyll, Dumbarton, Lanark and Renfrew. If we exclude the age group over 14, thus dealing only with children in Elementary Schools, or at the primary stage, we find that the attendance gains in regularity with the age of the pupils in Argyll, Bute, Dumbarton, Dumfries, Kirkcudbright and Renfrew. Hence Mr. Thompson's remark already quoted appears to be strictly applicable to Wigtownshire only.

5. Two particular facts remain unaccounted for (*a*) the very low percentage of the first age group in Dumbartonshire, and (*b*) the low percentage of the highest age group (over 14) in Ayrshire. There seems no reason why children in a county largely urban and industrial like Dumbarton should be so irregular at the earliest stage, and as little can one guess the cause of irregularity over 14 in Ayrshire, which is well supplied with Higher Grade and Secondary Schools, unless it be that in many Supplementary Courses in this county there is a large amount of intermittent attendance after the compulsory age.

Completeness of Roll.

From the source already drawn upon certain statistics as to completeness of roll may be cited on account of their bearing, not only upon the average attendance in each age group, but also on the final product of the Primary Schools as shown by the number completing the curriculum and obtaining the Merit Certificate; for, as Dr. A. D. Thomson remarks, it is, if not impossible, at least very difficult for an average child who enters a year later than the proper age, to pass through the school and spend a year in a Supplementary Course before he is fourteen.

Without entering into details, I may say that the totals for the Division show the following results :—

Results deduced from the statistics.

(*a*). Nearly 78 per cent. of the children between 5 and 7 are on the roll of the schools. It will be seen at once that this represents only a fair proportion of such children, and that there must be a large number of parents who deliberately withhold their children from school till after they are 7 years of age. After making every allowance for children who are educated at home in the early stages, it is obvious that a very large number are simply evading the compulsory law, and are thus adding to the total of those who fail to complete the curriculum of the Primary Schools.

(*b*). It is very satisfactory to find that in both the higher age groups, 7–12 and 12–14, the roll is reasonably complete. In the one case 96·3 per cent. and in the other 93·7 per cent. of the children at these ages being, if not in attendance, at least enrolled in some school within the Divison. The smaller number in the higher age group is, of course, in part accounted for by the number of pupils at this age exempted in each School Board area.

Exemption.

Exemption and rate of exemption.

The total number of pupils in the Division exempted from attendance at school before the age of 14 last year was 3,539, an exemption rate of about 8 pupils per thousand on the total roll and of rather less than 40 per thousand of the roll between 12-14. As nearly every exempted pupil belongs to this age group the latter figure will be used for purposes of comparison. On this basis the exemption rate for each county is given below but it must be remembered that the term "Lanark" includes Glasgow and Govan, and that in these urban areas the exemptions are comparatively few, and are dealt with separately in what follows :—

County.	Roll between 12–14.	Exemptions.	Rate per thousand on roll of age group 12–14.
Argyll - - - -	2,708	26	9·60
Ayr - - - - -	10,091	1,260	124·86
Bute - - - - -	619	29	46·88
Dumbarton - - -	4,608	126	27·39
Dumfries - - - -	2,854	61	21·37
Kirkcudbright - - -	1,352	40	37·19
Lanark - - - -	52,476	1,518	28·92
Renfrew - - - -	12,685	381	30·03
Wigtown - - - -	1,398	98	70·10
Totals - -	88,791	3,539	39·85

Extreme rates.

The extremely low rate of exemption in Argyll will at once be noticed; and the equally extreme rate in the opposite direction which characterizes Ayrshire is no less remarkable. In this connection H.M. Inspector Mr. Lobban has the following pointed remarks:—

"The worst feature of the attendance is the altogether abnormal extent to which the practice of granting "Exemption" has been carried. There is nothing in the circumstances of Ayrshire to account for its unenviable position as easily the chief defaulter in this respect. There can be little doubt that the really necessitous cases form but a small proportion of the total number of exemptions. The evil is not lessening, if anything it is spreading, and drastic measures are required to check its progress. If an example were made of one or two of the worst offenders, the effect on the whole county would be beneficial."

Wigtownshire, as might be expected from the irregularity of the attendance, has also a very high exemption rate. Bute is the only other county above the average: in all other cases the rate of exemption, while lower than the average of this year, is, except in Dumfries, considerably higher than the average of the previous year.

Increase in exemptions.

The total number of exemptions has risen from 2,176 last year to 3,539, an increase of 1,364. As the roll between 12 and 14 is less by 433 than it was last year, this cannot be regarded as a satisfactory state of matters, and this feeling is strengthened by the consideration that the exemption rate per thousand of last year, which was 24·60, has now risen to close upon 40.

When the numbers exempted in each county for two successive years are compared it is found that there is an increase in every case except in Argyll and Wigtown, and in both of these cases the decrease is small. The general conclusion must therefore be drawn that, rightly or wrongly, School Boards in the Division generally have been granting exemption on a more liberal scale than in the past, and that, in two cases at least, their liberality appears to exceed any reasonable necessity, while in the case of Ayrshire it seems to be both indiscriminate and hurtful.

A comparison.

It may be safely asserted that there is more real poverty in the urban areas of Glasgow and Govan than in any other part of the Division—even in the thickly-peopled industrial districts of Ayrshire. Yet in the schools under the School Board of Glasgow only 71 pupils were exempted last year (1907) as compared with 120 in the previous year (1906). The corresponding figures for Govan are 250 and 157—an exemption rate for the urban area of about nine per thousand. It cannot be contended, if exemption is to be granted only to children in "necessitous circumstances," that such children are more numerous in Ayrshire and Wigtownshire than they are in Govan and Glasgow, and if they are not more numerous the inference from the statistics is irresistible.

Conditional exemption.

The pupils exempted conditionally outnumber considerably those who have been unconditionally released from school attendance, but the condition imposed is usually attendance at an Evening Continuation Class. How this works—or rather does *not* work—in practice will be dealt with in the Report on Continuation Classes (*q. v.*), but it may be said here that the exempted pupil, whether through weariness or indifference, does not greatly improve his attainments by such attendance, and that he frequently exchanges a considerable part of his day school life for a very brief and intermittent attendance at an evening class.

A brief summary of the reports of the District Inspectors on attendance and exemption will further illustrate the points dealt with in the preceding paragraphs.

Glasgow District: H.M. Inspector, *Dr. A. D. Thomson.*

H.M. Inspector, Dr. A. Douglas Thomson points out that the percentage of average attendance to the average roll in Glasgow Schools has fallen from 87 to 86·8, and that it is below the average for Scotland (88·07). This comparatively low percentage is, perhaps, to some extent accounted for by the stringent rules of the Board regarding withdrawal of names from the roll. There were only 302 cases in 1907 where the circumstances justified the prosecution of the defaulting parent or guardian, and the corresponding number (241) in 1906 was still smaller. The activity and vigilance of the Board in administering the compulsory clauses is shown by the fact that 4,995 cases of default were dealt with in committee.

In Glasgow both the total roll and the total average attendance are less this year, but on the other hand Dr. Thomson refers to the satisfactory increase on the roll of pupils under 7, and to the increased average attendance in Infant Divisions, in Supplementary Courses, Higher Grade Departments, and special classes for defective children. There is still room for improvement, however, and that this is well understood by the Board is evident from the following remark made by the Chairman, and quoted by Dr. Thomson :—

> "In moving the adoption of the report the Chairman of the Board remarked that they must not be satisfied till they got every healthy child to school between the ages of five and six years."

The question of completeness of roll in Glasgow continues, therefore, to engage the attention of the School Authorities. In spite of the slight improvement noted this year and last year, nothing like completeness of roll exists between the ages of five and six. Between 6 and 14, 96 per cent. of the estimated population at those ages are on the registers; between five and six less than 50 per cent. of the children are on the roll of any

school. The actual number of such children not on the roll is 6,709, and it is interesting to compare this with the figures for the two preceding years. In December, 1905, the deficiency was 7,672, in 1906 it was 7,091, and as already stated in 1907 it was 6,709, so that, though the encouraging improvement spoken of in last year's Report has not been maintained, yet fair progress has been made in this important matter.

As a result of this deficiency in the roll of children between 5 and 6, Dr. Thomson remarks that "late entry" is still characteristic of the Glasgow Schools, and he speaks strongly of the effect of "late entry" on the number of pupils who complete the curriculum.

Lanarkshire District: H.M. Inspector, *Mr. G. Andrew.*

In the Report on the attendance in Lanarkshire a number of very important points are discussed: First, the comparative slackness in working the compulsory clauses prevailing in certain large centres, and, second, two of the causes which lead to such slackness on the part of School Boards. The first cause is defective school supply. In many cases the school population has outgrown the school accommodation, hence any effort to get a complete roll, and to enforce entry at the legal age only emphasises the deficiencies. School Boards therefore take no definite census of the school population, or only take such a census at wide intervals of time. It is suggested that one census at least should be taken by each Board during its term of office, and two illustrative cases are given showing the necessity for such action. Bothwell School Board recently found that 1,316 children of school age within its area were not attending any school, and in the case of Dalziel School Board the number of such children was already 300, although the census was still incomplete.

H.M.I. Mr. Andrew also points out the serious effects on educational efficiency of the "late entry" of pupils—such pupils spoil, or at least hamper, the organization of the school, and they generally leave before completing its curriculum; but the effect on the parents is equally, or even more, serious, for they come to think that 6 and not 5 is the legal age of entry, and they act accordingly.

This suggests the second cause of the lack of vigour in enforcing the compulsory clauses. Failure to send a child to school at 5 is not looked upon by magistrates as a punishable offence, and there is a growing vague feeling that 5 is rather an early age to begin school life. Consequently there is difficulty in securing convictions against defaulters.

School Managers may, however, educate public opinion on this point, and Mr. Andrew hopes that, as many important Boards are becoming active in the matter, there will be marked improvement next year.

So far as the pupils actually on the roll are concerned regularity is reasonably satisfactory, but there is a minority of pupils of whom Mr. Andrew says :—

"Defaulters, truants, malingerers, mother-helpers and the like have to be constantly watched, if anything at all is to be made of their education, and it must be the constant effort of local authorities to keep this minority as small as possible."

Compulsory officers are generally zealous and efficient, but it would appear from the report on the subject sent in by Sub-Inspector Mr. Shanks that they are occasionally insufficient in number and that they are sometimes not effectively supported by the School Board which employs them. Mr. Shanks also points out, as a cause of irregularity, the feeling which has sprung up among a certain class of parents, since the extension of the school age, that, as the pupils must attend till they are 14, there is "no harm in keeping them at home occasionally." But intermittent attendance is more disastrous educationally than prolonged absence, and it is much less easy to deal with. The influence of the teacher, rightly exerted, is better than even the most effective legal machinery in combating the tendency to keep children at home for merely trivial causes.

Intermittent attendance appears to be more common in the industrial areas than in rural districts. In typical cases it was found that only 5·6 per cent. of the country children, who had long distances to walk, were absent, while of the colliery children, whose schools were close at hand, 29 per cent. were detained at home.

Mr. Andrew has the following remarks on the subject of exemptions in Lanarkshire, where, as has already been indicated, the rate of exemption would in all probability be much higher were it not for the very small number of exempted pupils to be found in the Glasgow and Govan areas, which are included in the statistics for the whole county :—

"While Boards varied very considerably in their attitude towards this question, in too many cases the standard of what constituted 'necessitous circumstances' was pitched ridiculously low, and many selfish parents were enabled to exploit their children in the mine or in the foundry without any regard to their education or welfare. In some mining villages it had come to be regarded as the natural procedure for a parent earning 25*s.* or 30*s.* a week, to ask exemption for his boys on reaching the age of 12, and in far too many cases such exemptions were granted."

Ayrshire District : H.M. Inspector, *Mr. Lobban.*

The following quotation from H.M. Inspector Mr. Lobban's report on Ayrshire is important :—

"In my last report I referred to the practice of 'purging the roll' for the purpose of showing a high percentage of attendance. That tendency has disappeared and the statistics bearing on the subject of attendance may be accepted as substantially correct."

Mr. Lobban also refers to the marked improvement which has taken place in the age of entry. This is clearly seen by the statistics which have already been given, and Mr. Lobban supplies, in addition to the shortened day for the infants, two additional

causes for the position which Ayrshire occupies in this respect. These are the increased activity of School Boards and the "fixed dates of enrolment," which have been introduced into infant departments.

The question of exemption in Ayrshire has already been fully dealt with, but the attention of School Boards in the county may again be drawn to the altogether abnormal number of exemptions and to the emphatic opinion on this subject expressed by H.M. Inspector for the District.

Dumfries District: H.M. Inspector *Mr. D. Thompson.*

H.M. Inspector Mr. David Thompson remarks that the ordinary circumstances of a school do not always account for the fluctuations in the attendance, for the highest attendance is often in the weeks preceding the intimated visit of the Inspector. This, perhaps, is additional proof of what can be done by means of the teacher's personal influence.

Where Managers encourage regularity as well as compel it, very satisfactory results are obtained.

"There cannot be a doubt that in some, nay rather, many parts much more might be done by the Managers both to encourage and to enforce regularity. In some parts no thought seems to be given to encouraging attendance. The mere receiving of reports from teachers and officers avails nothing; vigorous measures should be taken when the reports demand them. On the other hand, very satisfactory, sometimes even excellent, attendance is secured where Boards show real interest in the education of the children."

Neither H.M. Inspector Mr. Harvey * nor H.M. Inspector Mr. D. Munro Fraser refer specially to the attendance in their districts, but the main facts have already been dealt with in the early paragraphs of this section.

Junior Students.

The Junior Student system.

Although it is still too soon to form an adequate estimate of the far-reaching results of the establishment of the Provincial Committees for the Training of Teachers, or of the equally important effects which must follow upon the working out of the Training Regulations, there is one portion of the training system, and that not the least important, which comes directly under the notice of the Chief Inspector of the Division, and which may, therefore, as it has been for a full year in operation, now receive more particular notice. This is the Junior Student System, which has, to a very large extent in this Division, superseded the pupil teacher system.

What the new system involves.

The essence of the change is perceptible even in the new name; the junior student is essentially a student, the pupil

* From statistics supplied by the Govan School Board's Chief Compulsory Officer, it appears that the percentage of average attendance to the average roll for the year ending June, 1907, is in the Public Schools 87·3 and in the Roman Catholic Schools 87·6; both figures compare favourably with those for Glasgow.

teacher was virtually a teacher. In the case of the former the general culture of the individual is the aim of the course, in the case of the latter a measure of skill in class management was, at the best, its final outcome. In the one case professional training is subordinated, but not neglected or omitted; in the other, general education was often subordinated, and some of its essentials not unfrequently omitted. Even where the pupil teacher system survives, the conditions have been so ameliorated by recent regulations that a fair approximation to the work of the Junior Student Course is demanded of all, and the actual labour and responsibility of teaching have, to a large extent, been removed from boys and girls who, because of their general immaturity of mind and body, are distinctly unfitted to bear it.

New conditions for Pupil-Teachers.

Forty schools in the Division have, at the date of this report, been recognised as Junior Student Centres;* twenty-seven of these centres are Higher Grade Schools whose organisation and staff permit the student to pass through a full curriculum of secondary education to the stage of the complete Leaving Certificate; the remainder are, with one exception, Secondary Schools; the exception is the Glasgow Pupil Teacher Institute, which in the meantime retains its somewhat anomalous position as both a Junior Student Centre and a Central Institution for the Instruction of Pupil Teachers.

Junior Student centres.

The details of the actual enrolment of Junior Students at these centres will be seen from the statistical table appended to this section, but the large total enrolment affords clear proof that, in this Division at least, little apprehension need be felt as to the adequacy of the supply of teachers in the future.

Enrolment at centres.

The comprehensive curriculum of the Junior Student Centres, and the success which has hitherto attended the instruction given in these schools, afford satisfactory guarantees that the Junior Students will leave the centres with a thoroughly adequate general education, and, doubtless, as the system is gradually developed, with a fitness for specialised University, Technical, and Professional Training, to which, even in the best circumstances, the most industrious pupil teacher could scarcely hope to attain.

Curriculum for Junior Students.

In all the centres Masters of Method have been appointed, and enquiry has elicited the fact that their schemes of training vary considerably both in regard to the time devoted to the work and in the methods by which it is done.

Schemes for practical training.

It is no doubt desirable that a school should, within certain limits, determine from its own circumstances what can be done in this matter, and so long as practical training receives the amount of attention which the new system postulates, undue interference with the freedom of the Managers to formulate their own scheme of training is to be deprecated.

* Some of these have at present "provisional recognition" only.

General Principles.

At the same time an attempt may here be made to formulate some general principles which should regulate any judiciously framed scheme of training.

1. The amount of time to be given to practical training should be graded according to the different years of the course, increasing gradually from the first to the third. The actual distribution of the time must be left to the Master of Method in consultation with the Head of the School, but it would appear that the scheme adopted by the School Board of Glasgow of giving a certain time per week in the months before Easter, and increasing this amount in the succeeding weeks, has obvious advantages. It is assumed that in working out his scheme the Master of Method will bear in mind the great importance of not allowing practical training to interfere unduly with the Students' class work, or with the organisation of the instructional classes.

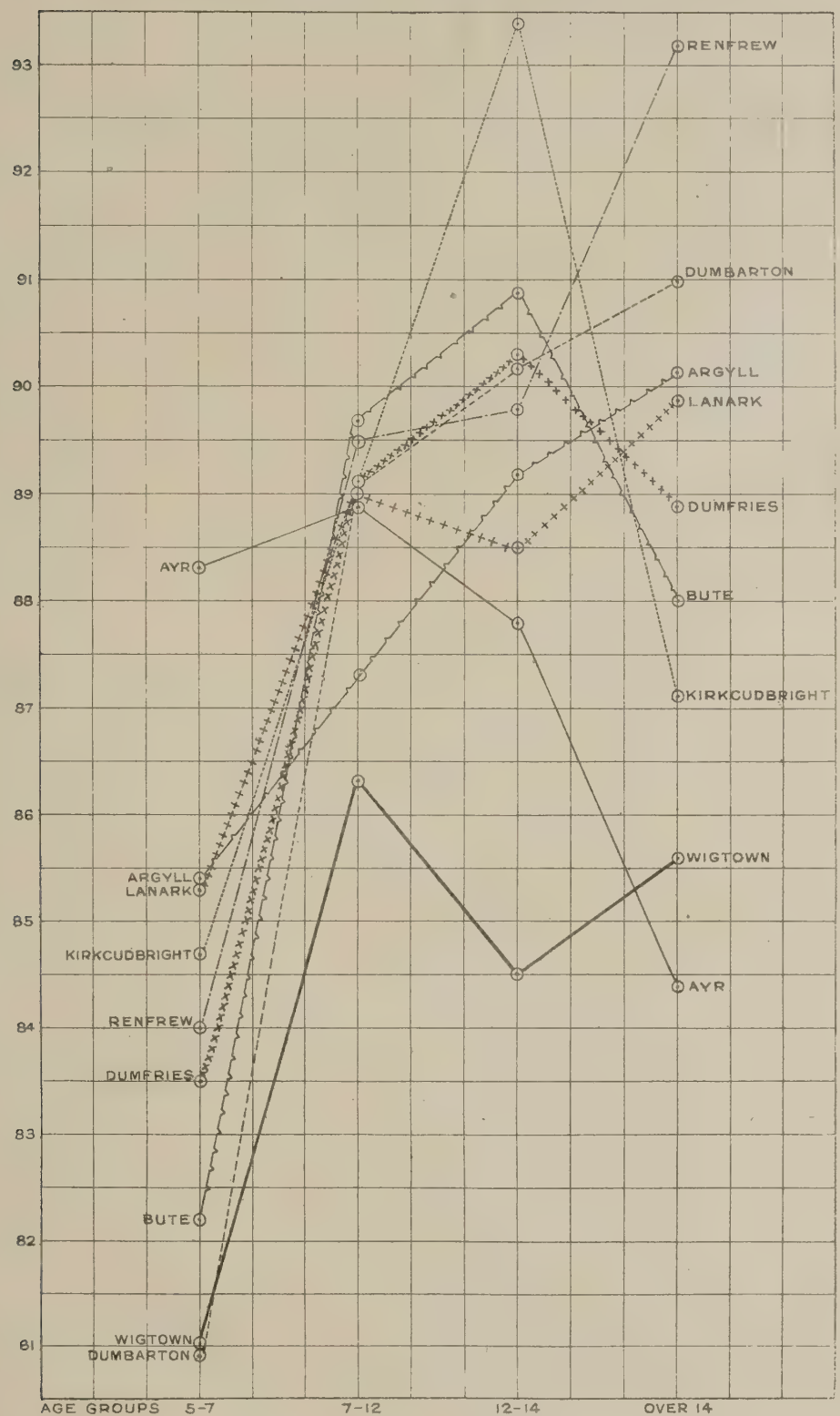
2. The total number of hours to be devoted to the practical training of the Students will, of course, vary with the schools, but certain limitations have been generally approved. The total amount of time should not, it is believed, greatly exceed three hundred hours, nor should it fall much below two hundred and forty.

3. The place which Theoretical Instruction in Education should hold in the scheme is important. Care must be taken, on the one hand, not to usurp the province of the Lecturers on Education and Method at the Training Centres, and, on the other, to avoid making the Student's practical instruction wholly empirical, and therefore unintelligent.

4. The theoretical lessons given should be such as can be readily and immediately translated into practice, when the student is in presence of his class; they should therefore be so framed that during his course the Student may learn the elements of class management and discipline, and the essentials of method in relation to the teaching of the primary subjects. It seems to follow that, wherever this is possible, the Master of Method should not only give the Theoretical Instruction, but should personally supervise the Student's practice.

5. As to the actual method of work it seems obvious that at first it should be largely observational, and that, in consequence, fairly large sections of students may be admitted to selected classes at a time. Their observation of the methods used might well be guided by the preceding theoretical lesson, recorded at the practical lesson, and discussed at the succeeding theoretical lesson. When it is judged expedient to begin actual practice of teaching, the sections dealt with must be smaller, and greater difficulty in organising the work in relation to other subjects will be encountered, but means will no doubt be found to enable all to share equally in the practice, without detriment to the non-professional course of study.

Percentage of Average Attendance to Average Roll in each Age-Group.



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Physical Training of Junior Students.

From Captain Foster's General Report quoted in the section on Hygiene and Physical Training, it is evident that this part of the Junior Student Course has benefited, and will still further benefit by the appointment of competent and suitable instructors. At several centres in the Division the Managers have shown a very praiseworthy readiness to act upon Capt. Foster's recommendation in this and other respects, and there is every reason to believe that this most important side of the Junior Student's training will steadily improve in efficiency.

Characteristics of the Students.

So far as my own observation of the Junior Students on the roll enables me to form an opinion, and I have seen the Student's at every one of the Centres, I think it is undoubtedly the case that they form a singularly intelligent and promising set of pupils, and this opinion is universally confirmed by the headmasters and teachers of the various centres.

STATISTICS OF JUNIOR STUDENT CENTRES.

NUMBER OF CENTRES 40.

NUMBERS ENROLLED TO DATE, DECEMBER 1907.

Name of Centre.	1st Year.			2nd Year.			Left for Training Centre.	Total Enrolment.
	Boys.	Girls.	Total.	Boys.	Girls.	Total.		
Campbeltown Grammar School	3	7	10	–	–	–	–	1
Dunoon Grammar School	4	6	10	–	4	4	–	14
Oban High School	3	9	12	1	5	6	1	19
Ardrossan Academy	1	9	10	2	5	7	–	17
Ayr Academy	2	12	14	1	1	2	–	16
Beith Spier's School	2	10	12	4	3	7	1	20
Girvan (Town) Higher Grade School	3	2	5	2	3	5	–	10
Irvine Royal Academy	7	12	19	1	4	5	–	24
Kilmarnock Academy	7	24	31	1	17	18	–	49
Carried forward	32	91	123	12	42	54	2	179

STATISTICS OF JUNIOR STUDENTS CENTRES—*continued.*

Name of Centre.	1st Year.			2nd Year.			Left for Training Centre.	Total Enrolment.
	Boys.	Girls.	Total.	Boys.	Girls.	Total.		
Brought forward -	32	91	123	12	42	54	2	179
Rothesay Academy - -	1	1	2	-	–	–	–	2
Old Kilpatrick, Clydebank Higher Grade School -	5	18	23	5	3	8	–	31
Dumbarton Academy -	1	8	9	1	5	6	–	15
Row, Helensburgh Hermitage Higher Grade School	1	6	7	–	1	1	–	8
Dumfries Academy - -	5	27	32	–	1	1	–	33
Dumfries, Mount St. Michael's College - -	2	–	2	–	–	–	–	2
Kirkcudbright Academy -	1	2	3	1	1	2	–	5
Airdrie Academy - -	5	4	9	–	1	1	–	10
Biggar High School - -	1	6	7	–	1	1	–	8
Bothwell, Bellshill Academy - - - - -	5	7	12	–	–	–	–	12
Cambusnethan, Wishaw High School - -	4	12	16	1	2	3	–	19
Coatbridge Higher Grade School - - - - -	6	17	23	–	–	–	–	23
Dalziel High School- -	–	14	14	3	6	9	–	23
Glasgow, Hutchesons' Boys' Grammar School -	8	–	8	–	–	–	–	8
Carried forward	77	213	290	23	63	86	2	378

STATISTICS OF JUNIOR STUDENTS CENTRES—*continued.*

Name of Centre.	1st Year.			2nd Year.			Left for Training Centre.	Total Enrolment.
	Boys.	Girls.	Total.	Boys.	Girls.	Total.		
Brought forward -	77	213	290	23	63	86	2	378
Glasgow, Hutchesons' Girls' Grammar School	–	5	5	–	3	3	–	8
Glasgow, Kent Road Higher Grade School -	6	14	20	–	–	–	–	20
Glasgow Pupil Teachers' Institute - - -	9	33	42	4	30	34	2	78
Glasgow, Whitehill Higher Grade School - -	11	21	32	–	–	–	–	32
Glasgow, Woodside Higher Grade School - -	6	20	26	–	–	–	–	26
Glasgow, St. Mungo's Academy - - -	13	–	13	6	–	6	–	19
Govan, Dowanhill R. C. Higher Grade School -	–	30	30	–	1	1	–	31
Bellahouston Academy, Higher Grade School -	–	–	–	7	12	19	–	19
Albert Road Pollokshields Higher Grade School -	8	33	41	–	–	–	–	41
Hamilton Academy - -	7	37	44	2	4	6	–	50
Lanark Grammar School -	1	5	6	–	3	3	–	9
Maryhill, North Kelvinside Higher Grade School	6	7	13	2	2	4	–	17
Carried forward -	144	418	562	44	118	162	4	728

STATISTICS OF JUNIOR STUDENTS CENTRES—*continued.*

Name of Centre.	1st Year.			2nd Year.			Left for Training Centre.	Total Enrolment.
	Boys.	Girls.	Total.	Boys.	Girls.	Total.		
Brought forward -	144	418	562	44	118	162	4	728
Cathcart, Queen's Park Higher Grade School -	2	16	18	–	10	10	–	28
Greenock, Holmscroft Higher Grade School -	7	15	22	3	15	18	–	40
Paisley Grammar School -	9	13	22	3	3	6	–	28
Newton Stewart, Douglas High School (Girls) -	–	4	4	–	2	2	2	8
Newton Stewart, Ewart High School (Boys) -	–	–	–	–	–	–	2	2
Totals - - -	162	466	628	50	148	198	8	834

TEACHING STAFF AND ORGANISATION.

Staff of Teachers—Glasgow.

The Teaching Staff in the Glasgow District is maintained at a satisfactory level in respect of both numbers and qualifications. H.M. Inspector Dr. A. D. Thomson quotes from the Board's Annual Report a passage showing the number of Graduate Teachers on the Staff, and stating the facilities granted by the Board to Class Teachers who desire to complete a University Curriculum.

In the Roman Catholic Schools in this District the Staff is not so satisfactory either in numbers or in qualifications, as in the Public Schools. In both respects, however, there has been improvement, but there is room for still greater progress.

Lanarkshire: A suggestion. H.M. Inspector, *Mr. Lamb.*

In the Report on Lanarkshire H.M. Inspector Mr. Lamb reports that the schools he has visited are, as a rule, and "*taken as wholes*" sufficiently staffed, but it is not uncommon to find organisation disturbed by the temporary absence of one teacher. Where this is the case, Managers have apparently provided only the bare minimum of necessary teaching power, and this in itself is an instance of false economy. Mr. Lamb goes on to suggest that large School Boards should have one or more teachers on their "unattached" list who would be

available for temporary service where required, and that there should be one such teacher for every school with over a thousand in average attendance. The disappearance of the Pupil-Teacher system makes this matter more urgent than formerly.

Govan and Dumbarton: H.M. Inspector, *Mr. Harvey.*

In the Report on the Govan and Dumbarton District, H.M. Inspector Mr. Harvey has the following tribute to the general efficiency of the teaching staff:—

"The Teachers both in Govan and Dumbartonshire are, taken as a whole, zealous, skilful and efficient. Faults of instruction and organisation, of course, occur, but I have seldom detected any signs of carelessness or inattention."

The Pupil-Teacher System: H.M. Inspector, *Mr. Munro Fraser.*

H.M. Inspector Mr. Munro Fraser rightly regards the "passing of the Pupil-Teacher sytem" as the principal event of the year, and he gives some interesting details of the steps involved in the transition from the one system to the other. In Argyllshire, Pupil-Teachers, on cancelling their engagements, were accepted by the County Committee as Junior Students, or as Intermediate Bursars. Many cases of similar action were to be found in Renfrewshire also; the important School Boards of Paisley and Greenock resolved to enrol no more Pupil-Teachers, and they sent those who were completing their engagement to Central Schools for instruction on alternate days. Proposals for new indentures had been, at the date of the report, received from only five Schools in the District. The effects of the change have been welcomed by the Pupil-Teachers who have become Junior Students or Bursars, and, though the amount of study demanded from the others is greater than formerly, the strain of such work is diminished by the larger amount of time available for it.

Supply of Teachers in remote districts.

Mr. Fraser in a most interesting section of his report deals with the difficulty of obtaining a sufficient supply of good teachers in remote districts. His remarks on this subject and his suggestions for remedying the evils complained of are quoted in full below:—

"In the remoter districts of Argyll, School Boards continue to find considerable difficulty in filling vacant positions. Large sums are spent on advertising, and when an appointment has been made, not unfrequently the successful applicant declines to come, having obtained more congenial employment elsewhere. Meanwhile the second applicant on the list has been making enquiry into the local circumstances, especially the character of the dwelling house that is attached to the school, and in her turn declines, and proceedings have to be begun *de novo*. In justification of cases like the latter, I am bound to say that some Schools Boards are indifferent to the comfort of their teachers.

"If teachers formed a branch of the Civil Service, the difficulty referred to could easily be solved. In the Inland Revenue Service, an officer may be in the wilds of the Highlands to-day and in the heart of civilisation to-morrow. And the difficulty, if not entirely surmounted, would be much lessened, if the management of educational affairs were entrusted to larger School Boards, who could promote teachers from the smaller schools to more enlarged spheres of duty after a limited term of service. But in the meantime the Scotch Education Department itself might possibly formulate a plan that would at once do justice to dwellers in the outlying districts and open a career to teachers of ability. Applications might be invited from Senior Students in the Training Colleges who would be prepared to serve

for a minimum of two or three years in these districts at salaries that in the case of female teachers might range from £100 to £120, three-fifths of this sum to be paid by the School Board and two-fifths by the Treasury A list of these Students could be kept by the Provincial Committees, to whom School Boards that were willing to enter into the proposed arrangements could apply for suitable teachers. A large proportion of these teachers would no doubt be Highland teachers, and it might be advisable as a general rule so to distribute them as to prevent them from going back to their native Parishes. Only the best teachers would be chosen for these positions ; they would have a distinctive name, which would be a guarantee of skill and furnish a claim for future promotion."

The changes in organisation.

The methods of organisation and classification adopted in elementary schools to meet the more recent conditions involved in the extension of the legal age of school attendance, the consequent establishment of the "Qualifying Examination," of Supplementary Courses, and of Higher Grade Schools were fully discussed in last year's General Report, and it is evident from the Reports of the District Inspectors that these problems, although they still present difficulties in detail, are, in their main elements, steadily progressing towards a permanently satisfactory solution.

The relation between Infant and Junior Divisions—A suggestion : H.M. Inspector, *Dr. A. D. Thomson.*

One of the most important details of organisation is referred to by Dr. A. D. Thomson. In last year's report it was stated that a certain "discontinuity of Method" between the Infant and the Junior Divisions exists in many schools, and that in these schools "the pupil is at once in a different, and less stimulating intellectual and moral atmosphere the moment he leaves the precincts of the Infant Department" and the suggestion was there made that "the spirit, and, to some extent, the methods of the Infant Department should be extended to the Junior Division." Dr. Thomson, as will be seen in the passage quoted below, would go a step farther, and would enlarge the sphere of the Infant Mistress by giving her the supervision of certain Junior Classes, and this suggestion is entirely in agreement with the recommendation of last year that "the boundary line between classes and divisions, and particularly between the Infant and Junior Division, should be a waving line, certainly not a hard and fast straight line."

"There seems to be no valid reason why the sphere of the Infant Mistress should not be so extended as to cover that critical period at which the transition from infant to junior work is being accomplished. Such a change would secure for the lowest junior classes that close supervision which yields such excellent results in the Infant Division."

That the supervision of the Infant Mistress at this stage would be beneficial is certain, for if there is an inexperienced or weak teacher anywhere in a large school it is here that she will often be found, and it is precisely here, therefore, that the greatest delay in promotion occurs, and that most supervision and advice are necessary.

Relative size of Divisions, Instructional and Age Divisions.

It is pointed out by Dr. Thomson that the Senior Division ought to be the largest, but that in the Glasgow Schools it frequently is less than the Junior Division and even less than the Infants. This refers to instructional not to age divisions, and Dr.

Thomson gives as the reason for this relation among the Divisions, where classification is correctly carried out, that, while it may be possible to save a year in the primary course, it is admittedly difficult to do this in the upper classes of the school, corresponding to the former 4th, 5th and 6th Standards. On this point it may be remarked that the statistics given in the Glasgow Board's Annual Report (January, 1908) show that the average attendance in the age group over 10 is greater than the attendance in each of the other divisions in 62 out of 75 of the Board's Schools. It would appear therefore from Dr. Thomson's statement that in the majority of these schools the instructional divisions do not correspond, as, in a general way, they should do, with the age divisions on which the grant is paid, and this implies a pretty general lack of correspondence between the age and the attainments of the pupils.

Other details of organisation —Glasgow District.

The following quotations from Dr. Thomson's Report deal further with this and other details of organisation in his district :—

1 "In a small senior division it is frequently found that promotion is determined not so much by progress as by the rapidity with which the upper classes are depleted by the withdrawal of pupils who reach the age of 14. Classification, which ought to be based on attainment, then becomes a matter of convenience, with the result that many pupils who appear to complete the curriculum do so only by the omission of essential portions of the scheme of work."

2. "Moreover it is painfully apparent that the pupils whose advancement with respect to age is unsatisfactory lose interest in their work long before they leave school, and that their indifference proves contagious. The lot of the teacher is too often to lead 'a flock that thirsts not to a stream abhorred.' The truth would seem to be that, owing to the congestion which prevails in the Junior Division, comparatively few of the Glasgow schools can have a really strong Senior Division—a conclusion which is confirmed by the small proportion of candidates who are presented for the Qualifying Examination in their thirteenth year."

3. "One point I wish strongly to emphasise. I refer to the ignorance which class teachers show of the complete scheme of school work. I would suggest that there should be put into the hands of every class teacher a copy of the scheme of work for the whole school. As it is, he usually has only that part of the scheme which affects the particular class with which he is dealing; and the tendency is to work in compartments as tight as ever the old 'Standards' were. Further it is highly desirable that the record of work for each class should be passed on with the class. It is only in this way that a new teacher can be reasonably certain of what the class has already done. History—especially when taught on the concentric system is perhaps the subject where uncertainty in this matter has the most serious effects."

Lanarkshire District: H.M. Inspector, *Mr. G. Andrew.*

Special attention during the past year has been paid to organisation in the Lanarkshire District. The problem has been approached from the point of view of the Qualifying Examination and the Supplementary Course, the object being to secure such modifications of classification and instruction as will result in a much larger proportion of the pupils reaching the goal of the Elementary Curriculum before leaving school. Good progress has been made in solving this,

the most important problem for the schools at present, but much still remains to be done, and the main difficulty—"the tradition of the Standards"—has not yet in many places finally disappeared.

Reorganisation of Schools.

All the better schools in Lanarkshire are now arranging *a five years course* from the Infant Department to the stage of the Qualifying Examination, and this will, in a few years, be the universal procedure. The result has already been a marked increase in the number of pupils presented for the Qualifying Examination. (See Section on Supplementary Courses, Tables I. and II.)

Ayrshire District: H.M. Inspector, *Mr. Lobban.* System of classification

The system of classification given in the last General Report by H.M. Inspector Mr. Lobban as typical of the Ayrshire schools is now passing beyond the experimental stage, and is reaching its full development. Here also, it has resulted in an increased presentation for the Qualifying Examination and in a reduction of the average age at which this stage is reached. This latter point is of great importance, for it is only by ensuring the proper preparation of the pupils for the Supplementary Course before they reach the age of thirteen, that we can be certain they will complete the curriculum, and, by spending a year in the Supplementary Course, earn the Merit Certificate, or at least receive some substantial gain from the continuous course of study involved.

Age of "qualifying" pupils.

Mr. Lobban gives an interesting analysis of the age at which the qualifying stage was reached in twelve of the most populous Ayrshire parishes. From the statistics given it appears that of 2,254 pupils who passed the qualifying examination 1,285, or 57 per cent., would in ordinary circumstances spend a year in the Supplementary Course, or would enter Higher Grade Departments. As the total number of pupils who passed the qualifying examination in the whole of Ayrshire was only 2,408 in 1905,* the fact that nearly as many were accepted from these twelve parishes alone at the date of the report is eloquent testimony to the amount of progress which has been made.*

Progress recorded.

Mr. Lobban justly regards the results he is dealing with as a distinct advance," and he believes that the gradual lowering of the age of entry to the Supplementary Course will go on for some years. He enters a word of caution, however, against the belief that the increase may be due to a lowering of the standard of attainment, and in this connection the following quotation from his report is in place:—

"The increase in the number reaching the qualifying stage is not, as far as I can judge, due in any measure to a lowering of the standard of attainment. Hitherto the pupils have, as a rule, been subjected by me to a fairly detailed examination over the whole range of their studies. A written test will, however, gradually become less necessary as the scheduled marks show—and they are showing—a closer approximation to uniformity of standard among the teachers of the county."

* It will be seen from the statistics of the Qualifying Examination (Table I) that this number is for the current year (31st August, 1907), no less than 3,822, an increase of 1,414 in three years.

Dumfries District: H.M. Inspector, *Mr. D. Thompson*

H.M. Inspector Mr. D. Thompson does not specifically refer to any modifications of classification in his district, but he finds that the presentations for the qualifying examination are generally satisfactory, that in many schools they are very gratifying, and in some all that could be desired. The importance of this test of the efficiency of the instruction is now generally recognised in the district.

Other problems.

The changes in organisation and particularly in classification dealt with above, together with the virtual abolition of the Pupil-Teacher system in the division, in conjunction with the lowering of the number of pupils for whom a single teacher is made responsible, have given rise to other problems, viz.:—the adjustment to the new conditions of class-room accommodation designed for the old, and the increase of staff which often becomes necessary.

Argyll and Renfrew District: H.M. Inspector, *Mr. Munro Fraser.*

H.M. Inspector Mr. Munro Fraser's Report is quoted on these points:—

"The abolition of pupil-teachers in certain schools has resulted in a slight increase of the ordinary assistant staff, but the additional expense which this involves has not been great. The price of unskilled labour has been saved, and manifest educational advantages have been secured for the children.

"A more serious problem is the adaptation of existing class rooms to the new condition of things. Rooms constructed to hold 70 to 80 pupils, in which a pupil-teacher was wont to work alongside a certificated teacher, are now out of date. In some schools it will be found possible to form three rooms out of two by means of partitions, but where such reconstruction is impossible, the total recognised accommodation of a school must suffer diminution and a good deal of space must apparently be wasted. The Paisley School Board has already taken steps to readjust the size of the class-rooms in two of their schools to the new conditions, and it is their intention in future years to make further structural alterations in their schools. During the present transition period there is no desire to press School Boards to do more than is absolutely necessary."

Staffing of Schools, "overgrown" classes. H.M. Inspector *Mr. Lamb* (Lanarkshire).

It frequently happens in large schools, even when the staff is, over all, numerically sufficient for the total average attendance, that certain classes are allowed to increase beyond the limit of efficient instruction by a single teacher. H.M. Inspector Mr. Lamb's remarks on this subject are important:—

"In many cases the certificated teacher has over, rather than under, 60 pupils on his roll. There are many class-rooms which were constructed to hold 70 pupils; and a considerable loss of accommodation would result from a rigid application of a rule that no Certificated Teacher should have more than 60 pupils in charge. One is prepared in the meantime to accept a roll, say of 65, but surely it is time to intervene when one finds a roll of over 90. It is true that the staffing for the whole school in which such a state of things exists may be and generally is adequate. None the less the burden on the individual teacher is excessive, and the demand now made for increased attention to the individual pupil and for increased attention to developing the intelligence of the pupil in all directions can only be met under such conditions by teachers who are very specially endowed with physical and mental energy, or who are prepared to sacrifice in their youth the reserve of strength which it is everybody's interest should be reserved for the later years of professional work."

That the "over-grown class" should so frequently be, as it is, an Infant Class is one of the worst features of such cases, for if the principles of the Memorandum on the Teaching of English are to be carried out, it is impossible for a teacher who has a class of 80 infants to give them the individual attention in connection with speech exercises which is absolutely necessary. On other than instructional grounds very large classes at this stage are objectionable, but this will be sufficiently obvious to all who are acquainted with the difficulties of Infant School work.

Relation of the Primary School to other Schools.

In last year's Report the place of the Primary School as an element in the general educational organisation was referred to, and it was shown that its internal organisation ought to have constant reference to its outward relation to other schools, and particularly to the schools devoted to Intermediate and Continuation work. H.M. Inspector, Mr. Munro Fraser, has this year the following important contribution to the discussion of this subject:—

H.M. Inspector, *Mr. Munro Fraser.*

"Care is taken, at least in Renfrew and Argyll, to give no help to pupils under 14 years of age 'to enable them,' as the Secretary remarks (in his annual report on Secondary Schools), 'to attend schools which are at their own doors and from which fees have long since disappeared.' The transfer of a pupil to the Intermediate or Secondary School as soon as possible after he has passed the Qualifying Examination is a matter of cardinal importance. It cannot be too forcibly impressed on parents and teachers alike that any other course of action means loss of time and educational waste. One or two cases that have recently come under my observation will make this clear. In a school in one of the Western Islands, a boy of 17 whose parents could quite well afford to send him to a neighbouring Higher Grade School was found studying Latin and other Secondary Subjects under the headmaster, whose other duties were sufficiently engrossing. In another school, a girl was, through want of thought on the part of the parents, kept at school till she could obtain the Merit Certificate, and only thereafter sent to a Higher Grade School in Glasgow. Yet another case which is by no means an isolated one: In this school a few pupils, who apparently mean to acquire for themselves an education that will fit them for professional life, are being taught Secondary Subjects in combination with certain parts of a Supplementary Course. 'Parents send me the pupils' the teacher says 'and it is my business to do the best I can for their education.' But it is his business also to educate the parent—that is to say, to point out to him that if a child has to leave school at or about the compulsory limit of age, he should be trained on particular lines, and that, if he wishes to aquire a secondary education, this can be obtained best at a Higher School under a specialised staff. Bursary or no bursary, the interests of the pupil demand that the parent should be made cognisant of these facts; and if the parent says he cannot afford to send his child from home it is surely the duty of the teacher to put before him the possibilities of the situation in the shape of Intermediate bursaries, payment of travelling expenses and the like. Only when a bursary cannot be obtained—and in the case I refer to there is no evidence to show that pupils 'so much as heard' of bursaries, much less applied for them—is the teacher entitled to do 'the best he can' for his pupil on the lines of an Intermediate Course."

The Competitive Bursary System.

Instances of a similar kind to those cited by Mr. Fraser are not wanting in other districts. The competitive system of obtaining bursaries which still prevails in the Glasgow and Govan Districts

in connection with the City and General Endowments Trust encourages pupils to remain, and teachers to retain them, in departments and courses unsuited to their stage of advancement and to their future prospects. This is additional and important evidence for the need of an inquiry into the whole Endowment and Bursary system as at present constituted.

Retention of Higher Grade pupils in Supplementary Courses.

At recent visits it was found in an important urban Higher Grade School that a considerable number of pupils from Public Schools under the same Board had spent one or two years in a Supplementary Course before entering the Higher Grade School. Such pupils not only leave, as a rule, before completing the Higher Grade Course, but they always hamper its organisation; for, while in English they may be quite able to take up the work of the second year, in all other subjects they must begin at the beginning. Parents, teachers, and managers are all, in varying degrees, responsible for this waste of time and energy, and teachers in particular ought to make a point—a point of honour indeed—of seeing that pupils who are to take a Higher Grade Course, begin it at the earliest possible moment after passing the Qualifying Examination.

Ordinary Subjects of Instruction.

I do not propose this year to enter at any length into the teaching of the ordinary subjects.

The teaching of Reading.

The Phonic Method of teaching Reading appears to be steadily spreading, except in the Dumfries District, where H.M. Inspector Mr. D. Thompson states that it has not as yet taken any root. Dr. A. D. Thomson draws attention to the fact that the distinctness of articulation which this method unquestionably produces is very apt to be lost as the pupil rises in the school, and he suggests (and I am entirely in agreement with him) that this might, to some extent, be remedied by extending the range of the Infant Mistress's supervision. This is alluded to in the section on Teaching Staff and Organisation.

Further, the distinct articulation insisted upon in reading is frequently not demanded in the case of oral answering, where slurring and slovenliness are sometimes tolerated. Dr. Thomson gives the following example:—

> "In reading, a child pronounces the word 'shilling' carefully and accurately, but in giving the answer to a question in arithmetic he does not hesitate to pronounce it 'shullin,' and very frequently such pronunciation goes unchecked."

Repetition of Poetry.

There has been marked improvement in regard to the selection of passages of poetry to be committed to memory for repetition, but Dr. Thomson is of opinion that, in not unfrequent instances, there is still room for improvement in this respect, and he further suggests that there is no reason why all the

members of a class should commit to memory the same passage; he urges that the selection of passages might, in the more advanced stages, be left very largely to the pupils themselves. In connection with repetition there are generally books of excellent selections in the hands of the pupils. One, however, often notes with surprise that, while every pupil possesses a copy of such selections, only two or three of the passages are made use of, the book otherwise remaining useless. If the selection is a wisely made one—and no other selection should be in the hands of pupils—every poem should be read through with the deliberation and expression essential to the bringing out of its force and spirit, the teacher sometimes reading in place of the pupil. This should be done until the whole book of selections has been traversed and the process repeated, time after time, throughout the session; in fact, for the notion of *committing to memory* there should be substituted that of becoming *familiarly acquainted* with the poetry, and by the close of the year it will probably be found that the bulk of the class, instead of knowing one or two poems *ad nauseam*, will have made a mental possession of the whole collection.

Reading-books and books for reading.

A similar view of the reading books in use would lead one to remark that there ought to be far more variety, and a much larger use of continuous and interesting reading matter than is often found, especially when we consider the necessity—yearly growing more urgent—of preparing the pupils, long before the Qualifying Examination is reached, for the fluent and rapid reading which is absolutely essential for fruitful work at the Supplementary Course stage.

"Out-of-date" reading-books.

Another point may be touched upon in this connection. In some schools—their number is certainly diminishing—the same readers continue in use for many years, becoming heirlooms in the family. Apart from the fact that younger children, especially in small schools, pick up much more of what they hear read in the higher classes than one is apt to suppose, there is to be remembered the fossilising effect on the teacher's own mind of going over the same matter year after year. In this connection I quote a passage from H.M. Inspector Mr. Munro Fraser's report:—

> "There are schools where the ordinary literary reader of a class has not been changed for generations. No doubt it is new to each successive body of scholars, and something can be said from an economical point of view against too frequent changes in school books. Two considerations, however, have to be borne in mind by School Boards of ultra-conservative tendencies. One is, that school books used during the boyhood of some of us are now a little out of date; the other is, that over-familiarity with the kind of literary material found in these books is apt to have a benumbing influence on the teacher's mind. The pupil's power of comprehension tends to be over-estimated, and the freshness and vigour of the teaching may be adversely affected."

All vigorous vitalising teaching, all teaching under which young minds are likely to expand and grow, must proceed from, and can only originate in, a teacher whose mind is not only full

but is also being continually renovated and refreshed. Every teacher, in spite of himself, has a tendency to get into grooves, and only by constant striving and effort to extend his own intellectual stores can this be overcome. In this connection the very newness of the tools affects considerably the work done with them, imparting to it a freshness, even an originality, which might otherwise be wanting.

Memorandum on the Teaching of English: Oral Composition

The principles formulated in the Memorandum on the Teaching of English are, to a most gratifying extent, permeating the teaching in the Infant and Junior Divisions of the School. Oral Composition is now, in all intelligently taught schools, assiduously practised at this stage to the general displacement of that teaching of Formal Grammar which, valuable enough at another stage of the school curriculum, was wasted effort and a source of weariness, if not a torture, to the pupils in the lower classes.

Written Composition

While oral practice should never be discontinued even in the highest classes, Written Composition naturally forms an all-important exercise at this stage. The work done is frequently of very satisfactory quality and is, on the whole, steadily improving. No subject, however, makes greater demands upon the skill, resourcefulness, and unflagging energy and outlook of the teacher. Faith must not be pinned to any one method. The most successful teacher is he who can call to his aid the best elements of every method, combining and fusing all in the crucible of his own mind.

Correction of Exercises.

In the case of large classes the difficulty of correction is often a serious one. If exercises are not revised, pupils soon come to know it and the work degenerates. At the same time much of the laborious "red ink" revision which one sees, and, from the point of view of the teacher's conscientious care, is glad to see, seems somehow to miss the mark. Probably a selection and grouping of typical errors, taken week by week and orally discussed in class, would have a better effect than returning compositions, however carefully revised, where the only comment is a "good," "fair" or "excellent" at the end.

Spelling

H.M. Inspector, Dr. A. D. Thomson, draws attention to weakness in spelling. If pupils be properly drilled along the whole line this weakness should not appear, and the matter seems one for vigilant attention on the part of headmasters.

The teaching of Arithmetic.

There is general testimony from all the districts that the teaching of Arithmetic is steadily improving especially on the oral side. Pupils are made to approach the subject intelligently by the solution of simple problems involving processes and quantities with which they are familiar from their ordinary experience.

A want of accuracy, speed and neatness.

There is, however, equal agreement that in the higher classes there is considerable lack of accuracy of computation, and Dr. A. D. Thomson makes reference, in the case of the Glasgow schools, to a want of clear and neat expression in writing of the processes involved. It would be a matter of the utmost regret if

this should continue, for, even in the old days of "payment by results," notwithstanding the admitted faults and drawbacks of the system one commendable feature stood out prominently—to wit, the pupil's power of "setting down" an exercise in Arithmetic on paper with positive elegance. While the value cannot be overestimated of a constant appeal in this, as in every subject of the curriculum, to the pupil's intelligence and actual experience, it must never be lost sight of that the elements of accuracy and speed are equally essential in computation, and that they can only be secured by constant practice. In such practice exercises the element of intelligence may, for the time, reasonably enough be less prominent, while the careful setting down of the work on paper constitutes a training which is not without its own value.

I am in thorough agreement with H.M. Inspector Mr. D. Thompson, when he remarks :—

"Expertness in the four elementary operations should be cultivated throughout the pupil's course, for, after all, these are the processes chiefly required in after-life. As a rule, rapidity of calculation is not regularly practised after the Junior Division."

The teaching of Geography.

I formulated my views regarding the teaching of Geography in such detail in my General Report on the Division for last year that I do not consider it necessary to enter at any length into the question again I may, however, be allowed to repeat that in every well taught school a pupil on reaching the qualifying stage should be possessed of a ready working acquaintance, on the topographical side, with the main features of the world. He should have imprinted on his mind a mental picture of the chief masses of land and water with their leading features of mountain, river and town ; he should have a knowledge of the leading ports and trade routes, some acquaintance with the leading commodities of international commerce, and especially of British Colonial Possessions in the different parts of the world. It is on this foundation that the more scientific knowledge of Geography which will be looked for and demanded in the case of Higher Grade Departments, and to a somewhat lesser extent, perhaps, in Supplementary Courses, must be built.

Apparatus unused.

One cannot so much complain of the lack of appliances for the intelligent teaching of this branch as of an inadequate employment of them by teachers. It is still too common to find globes stowed away and covered with dust in headmasters' rooms, and relief maps hanging on walls, without any reference being made to them from the beginning of the session to its close.

The Memorandum on the Teaching of History.

The recently published Memorandum on the Teaching of History may be expected by-and-by to have a healthy effect on the spirit of the teaching in this branch. As matters are at present it must be regarded as one of the least satisfactory of the school subjects. There is general testimony to this effect in several of the reports of the District Inspectors. H.M. Inspector Dr. A. D. Thomson says :—

"As regards the methods of instruction in History, each teacher seems to be more or less of a law unto himself. The result would be good if all our teachers were tactful, imaginative, painstaking and capable of arresting and

holding the imagination of their pupils. But this is not so. . . The faculty of revision and recapitulation, of passing in rapid review a long series of events leading up to a consequence of magnitude and importance, is in many of our teachers not highly developed. Hence the mind of the pupil remains unenlightened and lost among details of which, for lack of a guiding and ordering principle, he soon possesses only a blurred and confused idea."

And H.M. Inspector Mr. Munro Fraser:—

"In regard to History, the issue of so many different text books, almost all differing considerably in plan and execution from each other, is a source of embarrassment to teachers. Following the lines of one or other of these, the subject is taught conscientiously and methodically, and yet, when a pupil reaches the Qualifying Class, it is not unusual to discover that he has a very vague conception of the evolution of his country and the main facts concerned in it. History, so far as it can be taught in an elementary school, can do two things for a pupil : it can, by legend and heroic tale, light up some noble deeds of human life for him, and it can, by an orderly arrangement and picturesque treatment of the leading events of each period, serve as a basis for future acquisitions. At present, in too many cases, the pupil is crammed with facts and loses his way among them. He attaches as much importance to the Wars of the Roses as to the Reformation or the loss of the American Colonies. In a small school in the Highlands I found recently on the blackboard a mass of facts and dates relating to the Wars of the Roses. On asking the teacher what meaning all this had for the children, and what relation to their intellectual development, I was told that *at a later period* they might possibly read Shakespere's 'Richard III.'"

The teaching of History: Essentials of success.

I have only one remark to make. If the subject is to be well taught, the teacher must really know with intelligence and exactness the particular period with which he intends to deal. He must teach out of a full mind; the teaching must be largely oral; he must know how to emphasise the essential, passing lightly over, if not wholly eliminating, the accidental; he must call to his aid every accessory likely to illustrate and rouse interest in the questions in hand. For example, there should be abundance of historical portraits, plans of battles, plans of ancient buildings, facsimiles of old documents, pictures of ancient weapons, ancient houses, furniture, and implements—of everything, in short, which will enable the pupil to realise to some extent the life of the past.

Scottish History text-books.

In connection with the teaching of Scottish History, to which reference is frequently made at the present time, it used to be a common remark that good and trustworthy manuals on the subject were not available. This want has now been supplied, and one or two books have recently appeared which seem to leave nothing to be desired.

Its place in the scheme of work.

I repeat, however, that Scottish History cannot be intelligently treated in the Senior Classes as a thing *per se*. If its main currents and movements are to be intelligently followed and understood, it can only be by clearly indicating their connection with contemporary movements not only in England, but also on the Continent and especially in France.

There is no doubt, however, that every child leaving a Scottish school should have some acquaintance with the stirring and romantic incidents with which the history of Scotland pre-eminently abounds.

The curriculum of the Primary School: alleged "over-crowding."

One frequently hears the statement made that it is impossible to teach any of the elementary subjects with the thoroughness desirable, owing to the over-crowded state of the time table. Teachers, we are told, have scarcely begun one lesson when it is necessary to leave off and enter upon something else; and, in connection with this, expression is sometimes given to a desire to hark back to the old days of individual examination.

The actual state of matters: New subjects—their justification.

Now let us enquire what the actual state of the case is. The average school week is one of about 25 hours for pupils above the Infant stage. The only subjects which can with any truth be said to have been added to the curriculum within recent years are Drawing, Nature Study, and Physical Exercises. The first-named subject was taught in a large number of schools under the old *régime*, and the desirability of every pupil acquiring a modicum of facility in Drawing, with the consequent training in observation which this involves, must be at once conceded. The teaching of Nature Study, so far as the lower divisions of the school are concerned, has simply been the giving of a more definite and direct place to a mode of teaching carried on formerly in all schools—generally in a desultory and often in a slovenly fashion—under the familiar name of "object lessons." The need for instruction of this type in all schools, and especially in city schools, is apparent, and the quality of this instruction will steadily become more living and definite as teachers receive adequate preparation for imparting it. The lack of any attention to Physical Exercises in the vast majority of our elementary schools was a standing reproach to the curriculum of former days.

Now, granting that at least two of these subjects—namely, Drawing and Physical Exercises—are direct additions to the time table, no one whose opinion is worth having would deny that they are not only desirable but necessary additions to any properly framed system of elementary education.

The time they take up.

Again, what is the amount of time they absorb? Out of the 25 hours per week, from one and a half to two hours are given to Drawing. At most, two half hours (but often only one), with a few additional minutes when classes are changed, are specially devoted to Physical Exercises. Nature Study generally is, and, indeed, in the lower classes should be, worked in with the ordinary Reading lesson.

Their educational effect.

So far from finding these subjects an additional burden, teachers find that the variety they lend to the work has an effect upon the children which makes their minds much more apt and supple in connection with the ordinary elementary branches, which still absorb by far the greater bulk of their time.

The former curriculum.

But, in contrast, what was the curriculum under that old *régime* which we occasionally hear obscurantists sighing for? Leaving out of view the more natural and healthy organisation which teachers are now at liberty to avail themselves of, it must not be forgotten that if, in those supposed "golden days," there need

be no Drawing and no Physical Exercises, there were the now obsolete "Specific Subjects." One of these could be attempted in the fourth standard, where many of the children had acquired but a very insufficient command of reading; two could be attempted (and generally were) in the fifth, and three in the sixth standard. It was not an unfrequent practice with many Boards to allow the grants for Specific Subjects to form part of the teacher's remuneration, with the not unnatural result that in every class every possible specific subject was attempted. It was quite common in the fifth standard to have all pupils presented in French and Latin, in the sixth to have all presented in French and Latin again, with, in the case of the boys, Physical Geography or Physiology in addition, and, in the case of the girls, Domestic Economy. Further, it has to be remembered that Reading in all standards above the third was combined with Grammar, and that, however fluently a pupil might read, if there was failure to point out "Parts of Speech," or to analyse a simple sentence, a failure in Reading was the consequence.

Instead, therefore, of adding to the burden of teachers and pupils in the Elementary School, the present arrangements have materially lightened and judiciously redistributed the weight, greatly to the advantage of all concerned.

School Libraries.

Importance of School Libraries.

The importance, indeed the necessity, for providing a proper supply of books for the use of pupils at all stages, both in Primary and Intermediate Schools is now well understood. The power of reading fluently is, in all schools where proper methods are employed, now earlier and more easily acquired than it used to be, and all intelligent teachers are anxious that this power should have a wide and healthy field for its exercise.

Number of Libraries—*Mr Jas. Coats, Paisley.*

Throughout the Division School Libraries have become much more plentiful in recent years owing to the wise generosity of Mr. James Coats, of Paisley, to whom many isolated rural communities, not only in the Highlands but throughout the West of Scotland, owe a deep debt of gratitude. He has not only given books for the seeing and the blind, but he has, by such thoughtful acts as the provision of an optical lantern for the Deaf Mute School at Paisley, still further shown his interest in the educational progress of his fellow-citizens.

Selection of books.

The books in School Libraries are, as a rule, very well selected, and, though they are more suitable, as a rule, for the older than for the younger children, yet in some cases there is a section for the latter which might, with great advantage, be used in the ordinary Reading lessons of the school. It is a pity that this is seldom done; often, in fact, the class of books referred to lie on the library shelves utterly neglected and unused.

From H.M. Inspector Mr. D. Thompson's report I take the following passages:—

"In Dumfriesshire and Galloway there are 85 Libraries, 20 of which have been given by James Coats, Junior, Esq., of Paisley. . . . As a

rule, the books in these Libraries can be used only by the senior scholars; and suitable books for the younger classes are very much wanted. To this matter the attention of managers and teachers has been directed; and it is likely that in the coming session the defect will in some cases be remedied. The Chairman of the Parton School Board, who has ever shown an enthusiastic interest in the educational affairs of that parish, is to provide books for the home-reading of the lower section of the school under his Board."

Singing.

Singing.

On this subject the reiterated recommendations of those who have reported on it from year to year have, so far as can be gathered from the remarks quoted below, produced but little effect. It is to be hoped that the defects which have so often been pointed out will be seriously taken in hand, where they exist, by the class teachers and the visiting masters. That these defects can be remedied without any great difficulty or trouble is proved by the inequality of attainment which is found in neighbouring schools, and which is one of the marked characteristics of the work in this branch. I would specially commend to the attention of all teachers of Singing in our schools the following report on this subject in the Glasgow Schools by H.M. Inspector Dr. A. D. Thomson:—

H.M. Inspector *Dr. A. D. Thomson.*

"In the Glasgow schools Singing is of very unequal merit; and the inequality may be as strongly marked between different classes in the same school as between different schools. In general, though it is gratifying to find many noteworthy exceptions, Singing is not so good as it ought to be. And this is probably the result of the system. The responsibility is divided between the visiting master and the class teacher. The former has a vast number of classes to see, and consequently he must leave much of the work to the latter, whose qualifications for teaching Singing are not always what could be wished. The tune is frequently pitched at random (without the aid of tuning fork, pitch pipe, or piano), the intonation faulty, the time incorrect, taste and expression hardly existent. Sex division for part singing is still quite common, and there appears to be little or no interchange of parts. Ear-tests—the response to which is nearly always intensely disappointing—seem to be given in the most haphazard fashion, and are not progressively graded as they should be.

"I would suggest that for every school a detailed scheme of work in Singing should be drawn up by the visiting master, that the songs at the various stages should be chosen from carefully selected lists, that sight-singing and ear-tests should be properly graded, and that regular exercises should be given in breathing and voice-production. I do not say that these things are never done; but the doing of them is not sufficiently methodical. I would suggest further—and this suggestion might be applied also to Drawing and Physical Exercises, subjects in which the lack of expert teachers is not less felt than in Singing—that head masters might endeavour to make arrangements whereby these subjects should be taught, say in each division of the school, by those members of the staff who are best fitted to teach them. This should surely be possible; and it would certainly, I think, be attended by beneficial results."

H.M. Inspector *Mr. Munro Fraser.*

H.M. Inspector Mr. Munro Fraser also refers to this subject in the following terms:—

"Singing, though accurate in respect of time and note, is still defective from the point of view of voice-training. The 'throaty' voice is almost a universal feature of country schools. The reason is that the majority of the teachers have not a practical acquaintance with the methods of voice-production. In some of the town schools it is apparent that the type of

song and the compass of the children's voices are receiving much needed attention, and as one of my colleagues, Mr. George Murray, remarks, 'if in some cases little good is being achieved, no harm is being done as formerly. What is wanted is a series of lessons by a competent choir trainer, with a boys' choir present to illustrate methods. A class of this kind,' he adds, 'could quite well be got up in Paisley.' Paisley has been the pioneer in several forward Educational movements recently."

Drawing and Manual Instruction.

Drawing and Manual Instruction.

The following report by Mr. Grigor, Sub-Inspector, on the Drawing and Manual Instruction of the Elementary Schools in the Division, is forwarded by H.M. Inspector Mr. F. W. Young.

'Missionary' work.

In submitting Mr. Grigor's report I should like to bear testimony to the good results which have followed from his whole-hearted devotion to his work in the various districts of the Division. He has super-added to his strictly official duty of examining and reporting upon Drawing, the *rôle* of a missionary in the way of disseminating sound principles of teaching the subject. He has held a large number of meetings for the teachers, at some of which I have been present, and has illustrated by blackboard demonstrations and otherwise the methods to be employed. Especially he has impressed upon teachers the need for proper *gradation* in the work and exercises, if genuine progress is to be secured, and I can testify from personal experience to the interest which he has in this way generated, and the fruitful results which have followed.

Sub-Inspector *Mr. Grigor.*

Mr. Grigor reports as follows:—

"Only a small number and proportion of the Elementary Schools in the Division can be visited annually, but as these are not confined to any one district, the work of the Division generally may, without unfairness, be inferred from what has been seen.

"Improvement is noticeable in the majority of the schools, an improvement which is more marked in the Nature Drawing than in the drawing of manufactured objects. This is explained by the fact that it is much easier to make successful arrangements for dealing with the former than with the latter. Collections of grasses, leaves, and flowers are now commonly seen in schools. They are not only useful for the drawing lesson, but may also be of service in the Nature Study lessons.

"To arrange for successful Object Drawing in crowded classrooms with limited floor space and conflicting lights is no easy task. That it is often satisfactorily accomplished is greatly to the credit of many of our teachers. To have an object in a good light and where it can be clearly seen by every pupil requires forethought and skill in arrangement. To ensure that each child honestly attempts to represent what is actually seen is a difficult task, but no Drawing lesson can be regarded as complete unless something of this character has been seriously tried.

"More critical observation on the part of the pupils is still desirable. Drawings are often the child's impression or recollection of an object suggested as much by the name of the thing as by the particular form placed before the class. Thus it is that a complete breakdown so often occurs when, in testing a class, an object is used, the form or proportion of which is new or unusual in the experience of the children.

"Real colour study is slowly supplanting Brush-drawing and the change is a distinct gain, not only in educational efficiency, but also in the creation of interest in the work on the part of the children. Colours are now more frequently found where stains and dyes were formerly used, and this substitution is a marked advance on previous practice.

"Clay-modelling is not so much taken up as its educational value would justify. The prejudice against the use of a material so *apparently* difficult to handle in an ordinary schoolroom dies hard. But Cardboard modelling is increasingly popular, especially for the boys of the Senior Division.

"With the natural growth of Supplementary Courses increased attention is being given to Manual Instruction in Woodwork. In the larger towns this subject falls naturally under the charge of special instructors. In smaller centres the class teachers usually have to add this to their list of subjects. Both sets of teachers are, as a rule, doing excellent work.

"In Manual Instruction work, whether Wood, Clay, or Cardboard, as well as in Drawing, the most hopeful feature of the outlook is seen in the large number of teachers who are continuing to give up no small part of their leisure to the further study of these subjects."

School Hygiene and Physical Training.

Growing interest in the subject.

There is a steadily growing interest in the physical well-being and training of the children. Physical exercises have been improved in method, they have, in many cases, been placed under properly qualified teachers or instructors, and the Official Syllabus of such exercises is now in general use throughout the Division; but there are prior conditions to be fulfilled before even the most perfect system of training can have its full effect on the growing child—conditions which have a powerful influence on general educational work, apart altogether from physical training and development.

I refer to the general sanitary conditions of school life and its surroundings.

Defective Sanitary arrangements.

There are few of the older type of schools which are not more or less defective in matters hygienic; these matters are, of course, the immediate concern of the Local Authorities and of their Sanitary and Medical Officers, but they are also the concern in a very intimate and direct sense of all who have to do with Education. There is concurrent jurisdiction in respect of school sanitation on the part of the Department and the Local Sanitary Officials, and I am glad to report that the relations between the Inspecting Staff and the Sanitary Authorities are intimate and cordial. A proof of this is found in the interesting report which Dr. Glegg, the Assistant Medical Officer of Health for Ayrshire has forwarded to H.M. Inspector Mr. Lobban. In Argyll, valuable aid has been afforded by the County Authorities to H.M. Inspector Mr. Munro Fraser, in his efforts to obtain proper sanitation, and particularly in the matter of providing a good and sufficient water supply for schools, and in other districts the reports of the Medical Officers of Health frequently contain a special section dealing with the sanitary conditions of the schools.

The Sanitary Authorities and the Department.

Ventilation.

Of all the multifarious aspects of School Hygiene perhaps the most important, and probably the most frequently unsatisfactory, is the ventilation of the school room, notwithstanding the fact that the physiological action of vitiated air on the whole organism, and particularly on the brain, and the consequent close

connection between "lack of intelligence" and "lack of oxygen" is being more and more clearly understood by teachers and school managers.

Many of our schools are, however, very defective in this primary condition of healthy educational work. Dr. Glegg reports of the Ayrshire Schools that :— Ayrshire: *Dr. Glegg.*

"Ventilation is probably the worst feature of our County schools. In none of them is any artificial system employed. I have found the air in too many classrooms at the end of the forenoon spell of work close and foul, charged with the heavy smell of the clothing and of the persons of the children. The great fault is the absence in nearly all class-rooms of proper cross ventilation. In some schools, and these by no means the oldest, the windows are effectually sealed and only a hinged pane at the top can be opened. Even where the means of efficient ventilation is at the teacher's disposal, I have often found this vitally important matter neglected."

H.M. Inspector Mr. G. Andrew finds that the schools of Lanarkshire also are, as a whole, very badly ventilated. A small minority of modern construction have good ventilation, but of the others he says :— Lanarkshire: H.M. Inspector *Mr. G. Andrew.*

"It is indisputable that at the present day large masses of children are kept for several hours every school day breathing a heated and vitiated atmosphere, in complete violation of the most simple rules of health. In the morning, classrooms may be quite fresh, they may even be a little chilly, fires being not yet at the glow, or pipes at full heat; there is no need of thinking of fresh air then, but, as the forenoon advances, teachers and pupils become so engrossed in the daily tasks that the condition of the atmosphere is often quite forgotten and is only realised on going out of doors. It is but the other day that we found a school with all the windows nailed up. We must recommend reduced grants less frequently for bad reading and bad arithmetic, and more frequently for bad air; lack of intelligence is a more venial fault than lack of oxygen."

H.M. Inspector Mr. D. Thompson also refers to this subject. In his district there has been here and there a certain amount of improvement, but in the large majority of his schools the windows are the only means of ventilation, and these are not so frequently used as they should be. Mr. Thompson has some remarks and suggestions on this subject which may be quoted here :— Dumfries: H.M. Inspector *Mr. D. Thompson.*

"Windows are apt to be kept closed in cold weather, especially if the teacher is not vigorous: and hence the danger to health. Every window in a room should be made to open easily, and every room ought to be provided with a pole for raising or lowering it. Exits for impure air are easily secured by the windows, but there ought to be ceiling-ventilators also, with freedom from down-draught. All draughts should be carefully avoided. The most important thing is the provision of fresh air inlets, which can be obtained at a moderate cost. These matters require more careful attention."

In the large urban schools the "plenum" system of artificial ventilation appears to be the one most commonly in use, and, while its defective action occasionally leads to complaint, as a rule it works satisfactorily. Capt. Foster, Inspector of Physical Training, pointed out at a recent Conference that in some cases there is no means of getting at the air-shaft, which is, therefore, often the dirtiest part of the school, and which, in consequence, must render the air passing through it more or less unwholesome. Ventilation of Urban Schools.

Necessity for opening windows, &c.

Some artificial systems of ventilation require for their satisfactory action that the windows be kept closed, but where this is not the case, teachers should systematically open doors and windows at the end of each lesson. It is to be feared that this duty is much too frequently neglected. Attention to it is specially necessary in the afternoon sitting when actual weariness may be added to the benumbing effects of bad air and cramped bodily postures.

Afternoon visits to Lanarkshire Schools.

H.M. Inspector Mr G. Andrew made a special series of afternoon visits to schools in Lanarkshire, and I quote his description of what he found.

"During the last hour one usually finds the rooms stuffy and oppressive; a tired and jaded teacher is doing what she can to keep a tired and jaded class at work; the children are at their worst, restless, irritable, incapable of fixed attention; generally writing, not to improve their writing, but to keep them doing something till the welcome sound of the bell proclaims that the stipulated tale of bricks has again been told."

Heating of School-rooms: *Dr. Glegg.*

Dr. Glegg also refers to this matter in connection with the closely related subject of the heating of the school room:—

"The open fire works well in a great many cases and is a cheerful and healthy influence in the rooms. The more modern schools are doing away with open fires and putting in hot pipes in their stead. It is of course easier by their means to have an equal temperature throughout a room, but they are to a large extent responsible, in my opinion, for the condition of the air I have just complained of. In rooms heated by hot pipes I have more often found the evils of bad ventilation, which are first evidenced by drowsiness and slovenliness in the children, and a tendency to irritability in the teacher. In this connection there falls to be considered the length of time the children are in class without any interval for a run in the fresh air. In a large number of schools there is no break in the afternoon, and the children are kept in a close atmosphere and in an unnatural restraint for a period of two and three quarter hours. This must be recognised as an adverse influence to their physical and mental growth. There should be a breathing space at the end of every hour, or at most of every hour and a half of work, so that the children may be refreshed by a run in the open, and that teachers and children alike may benefit by the flooding of the class rooms with fresh air."

Dumfries District: Heating.

In the Dumfries District visits of inspection without notice have shown that School Boards are sometimes more solicitous to reduce their expenditure on coal than to care for the comfort of the children and the teachers. To fix a date after which fires must not be lighted, is, in our capricious climate, where May has the habit of being as cold as December, simply a form of cruelty.

Lighting.

The lighting of schools is not unfrequently defective owing to the use of obscured glass, or of diamond panes. Such methods of lighting not only diminish the available light, but injuriously alter its quality, and windows filled with clear glass should, in every case, be substituted for them.

Water Supply.

Next in importance to Ventilation, etc., I would place the Water Supply of schools. In towns and large villages this is probably always adequate and nearly always good; in the rural parts of the Division it is frequently neither sufficient nor satisfactory. In such places it is often difficult to obtain a good water-supply in reasonable proximity to the school, and the

ntroduction of such a supply is consequently expensive, and is therefore avoided. A case came under my notice no later than this autumn in Mull where the only available supply of drinking water for the children was an open ditch by the road side.

H.M. Inspector Mr. Munro Fraser has the following remarks on this question:— Argyll: H.M. Inspector *Mr. Munro Fraser.*

"The water-supply of a fairly large number of country schools—mainly in Argyll—is unsatisfactory, and one or two flagrant cases have been dealt with during the past year. Whatever excuse there may be for the lack of interest shown by School Boards in the curricula of schools, the water supply of a school and the ventilation, scouring and brushing of class rooms, are matters in regard to which expert knowledge is not required, and it is much to be regretted that the threat of a deduction from the grant has sometimes to be resorted to before steps are taken to rectify obvious imperfections."

The provision of means for using the supply of water for personal purposes might sometimes be better. In Lanarkshire, for instance, it appears that

"There is often a lack of proper hand basins, and it is still too common to find hands and occasionally faces that will not stand a very close scrutiny. And yet it is surely by attention to these smaller points of personal cleanliness that the school may do much more to inculcate good habits, especially in grimy industrial districts, than by working through a text book of the laws of health,"

and in Ayrshire Dr. Glegg reports that many School Boards do not provide wash basins.

The publication by the Department of the Memorandum on the Cleansing and Disinfecting of Schools has made it unnecessary to enlarge upon this part of the subject. That there is urgent need for increased vigilance in this matter and increased attention to it, is evident from the facts mentioned at a recent Divisional Conference, from the District Reports, and from the special reports of County Medical Officers of Health. Cleansing of Schools.

All the evidence goes to show that many schools are neither so frequently, nor so thoroughly cleansed as they ought to be. In rural schools, while the floors may be regularly, though not often, washed, the cleansing of walls, ceilings and windows, seldom receives proper attention. Of the Ayrshire schools, Dr. Glegg reports that:—

"The condition of the floors calls for a word of remonstrance. A quarterly wash-up is all that is held necessary in nearly all of our schools. There are a few which have attained to a system of monthly cleansing, but surely this should be considered as a minimum requirement. A very small minority add a disinfectant to the water when the floors are washed, and this I should like to see become a general practice. I have examined bacteriologically the dust of school room floors and find that such dust is a very perfect breeding ground for germs of all descriptions."

There is not much use, as H.M. Inspector Mr. Munro Fraser remarks, in learning by heart the advantages of cleanliness when the floor of a school is scoured only once in the year.

The importance of a carefully kept and frequently inspected Cleansing Register cannot be too strongly insisted on, and its use should in a very short time, work a great improvement in the every-day condition of many schools. The Cleansing Register.

The sanitary state of the play-ground and its appurtenances is usually fairly good, and does not call for special remark, except that a really suitable material for covering the surface of the play-grounds in the country has yet to be discovered. In wet weather it is not uncommon to find the playground covered with pools of rain water, nowhere more often than at the entrance gate, and in other cases the surface is so unsuitable for either play or drill that the play-ground, as such, is of very little use.

Cloak-room accommodation.

The absence of cloak-rooms, or their insufficiency, leads to the insanitary habit of piling up wet clothing, or hanging it on pegs round the room. The effect of this on the air of the school-room can readily be imagined. With regard to this defect in some of the Lanarkshire schools I quote the following passage from the District Report:—

> "In many of the older buildings, defective cloak room acccommodation is often in evidence, with the result that in wet weather dripping garments are hanging on pegs round the walls of rooms in which children are being taught. This is a most objectionable practice, which requires to be stamped out."

Teachers retiring-rooms.

The absence of retiring rooms for teachers is a defect which comes immediately within the sphere of the District Inspector, and it is one which should in my opinion be specially and thoroughly dealt with where it is found to exist. Stranraer Academy and Stranraer High School, both housed in the same building, are glaring instances of the defect referred to.

Furniture and desks.

In many of the schools the furniture, and especially the desk accommodation, is of antiquated and unsuitable type, and Dr. A. D. Thomson's criticism of the furniture in certain Glasgow Schools has already been given. (See Section on School Supply). Such desks lead to fatigue, to muscular strain, and to unhealthy bodily positions and habits. This is of special importance in Infant schools and Divisions, but in this part of the school the defects mentioned—especially the lack of back supports to the desks—are most frequently found, and are most injurious to the children.

The use of slates.

One question of great practical importance must be briefly noticed. It can no longer be denied that in most schools where slates are still used the methods of using them make them a positive danger to the health of the community. It is held by some whose opinion is entitled to respect that "Jotters" are equally dangerous, and that, even if they are not, they are objectionable on other than hygienic grounds; but the weight of expert opinion appears to be against both of these contentions, and in fact, "Jotters" are now very widely used instead of slates in the best schools, large and small, in every district. If slates are to be used their admitted hygienic dangers ought to be minimised by proper methods of cleansing and disinfecting them, and Dr. Glegg's suggestions in this regard are worthy of the careful

attention of teachers and managers. I therefore quote the following passage from his report, and I heartily endorse his remarks:—

"I have purposely left till the end a matter in connection with the daily routine of class work, which is in urgent need of reform. I refer to the universal practice of spitting upon slates to 'clean' them. This practice is responsible in large measure for the epidemics of scarlet fever, measles, whooping-cough, and diphtheria, which so frequently originnate in schools. These diseases, and measles very especially, still persist despite the improvements modern sanitation has effected. Can this be wondered at when the filthy habit of spitting is deliberately encouraged in nearly all our schools? The infection of these zymotic diseases lurks in the mouth and throat, and it is clearly evident that a custom so universal must be a great agency for the spreading broadcast of these so often deadly diseases. The matter can only be put right by a general order forbidding the practice. As the Boards provide ink wells in the desks, might a small water pot not also be introduced beside them for the cleaning of the slates? Other means of slate cleaning suggest themselves, but the urgency of the matter will be readily admitted."

Medical Inspection of Schools, Glagow and Govan.

The School Board of Glasgow have carried out a number of thorough and special medical enquiries and inspections by specially skilled experts, although they have not as yet appointed permanent Medical Inspectors of Schools. The Govan Parish School Board, however, have during the past year appointed ten Medical Inspectors of Schools. The instructions issued by the Board to their Inspectors are, so far as I am able to judge, admirably clear and comprehensive. They have also drawn up and issued a "Health Schedule" which is, I understand, to be filled up jointly by the teacher and the Medical Inspector. It provides a record of four examinations, and it seems to be remarkably well fitted to furnish valuable information about the physical condition, not only of the individual child, but, when all the facts for a series of years are collected, of the whole community.

This, so far as I am aware, is the only instance in the Division of the appointment of Medical Inspectors, but various special enquiries and examinations have taken place in other centres besides Glasgow.

A Report on the Physical Condition of Glasgow Children.

A most interesting and important research was made last year by Dr. Leslie Mackenzie and Capt. Foster with regard to the condition of the children attending the Glasgow Schools. Their report, published by the Department, proves conclusively the truth of the remark that the "home is the real health centre," but perhaps the most serious result brought out by the enquiry is that both in height and weight the average Glasgow school boy or school girl under fourteen years of age is distinctly below the standard of the Anthropometrical Committee. In the county of Lanark, on the other hand, the Medical Officer of Health reporting on 1,424 children examined in three schools says that:—

"The figures obtained for the average stature and weight of children attending the different classes compare very favourably with the figures taken from the report of the Anthropometrical Committee, in fact the weights are all slightly above the latter."

Cigarette smoking.

It may not be absolutely proved, but there is strong reason for believing that the extremely hurtful habit of cigarette smoking, which is almost universal among boys of a certain class in Glasgow, has a great deal to do with their somewhat unhealthy and frequently stunted physique.

Need for vigorous effort to improve School Hygiene.

In view of all these facts there is apparent need all over the Division for a vigorous effort being made to generate a keener hygienic conscience among teachers and managers in regard to this aspect of school work. A Holy War, in short, should be declared against dirt in all its forms, and, if this is done, matters will steadily and even rapidly improve.

Physical Training.

The increased attention given to school hygiene has been shared in by the closely allied subject of Physical Training, and this may be regarded as one of the most hopeful signs of health reform in schools. That this increased attention to the subject is widely spread is evident from Capt. Foster's general report, which I have had the privilege of perusing. I summarise below those parts of the report which have special reference to the Western Division.

Capt. Foster, Inspector of Physical Training.

Capt. Foster notices the success of the course of Physical Training for Infant Mistresses in Glasgow, and he emphasises the importance of such courses in view of the fact that the actual physical exercises are best performed in the schools where the class teachers have been properly trained in the methods of giving such instruction. The School Board of Glasgow have arranged their course of training for Junior Students, so that the exercises given are in correlation with the subsequent course of instruction which the students will receive at the Training Centre under the Provincial Committee; and the combined scheme has been carried out by the newly appointed and specially qualified instructors, Lieut. Street and Mr. Gooderson. The Girl Students are trained by two ladies who qualified at Dartford Physical Training College. Govan School Board has appointed a lady trained at Chelsea, and the School Boards of Irvine, Hamilton, Kilmarnock, Paisley and Greenock have all appointed properly qualified instructors.

The chief difficulty in improving Physical Training.

The chief difficulty met with in the reform of methods of Physical Training is the lack of expert knowledge on the part of the teachers. Successful classes for the further instruction of teachers in this part of the work have been held in several parts of the Division. H.M. Inspector Mr. Munro Fraser specially mentions the success of the class for teachers in his district, and the classes in Glasgow have been already noticed. Where, as in Paisley and Greenock, specially skilled instructors have been appointed. it is to be hoped that the managers will allow them to devote a large part of their time to the training of the teachers and the supervision of their work in the Elementary Schools.

Success of Teachers' Classes.

The difficulty of obtaining qualified instructors is probably greatest in the country districts, but there, in some cases, arrangements have been made, which Capt. Foster notes with approval,

by which expert instructors appointed by the County Committees have been allowed to supervise Physical Training in rural schools, and thus in some measure to enable the teacher at some future time to discharge this duty for himself. It is in this direction, I am persuaded, that improvement in the methods of Physical Training within rural areas must be sought for.

Feeding of school children.

With regard to the feeding of school children there is little to add to the facts which were given in last year's General Report. There can be no doubt that, in rural districts especially, every effort should be made to see that the children have a warm meal in the middle of the day. The great majority of town children are much less exposed to the inclemency of the weather and to bodily fatigue than the country child, and, in towns, children in necessitous circumstances are well looked after by the various charitable organisations. In the country the necessity for the provision of meals is not to any extent a question of poverty, but arises from other circumstances, among them the distance the children have to walk to school, the early hour at which they must often leave home, and the scanty or unsuitable food they bring with them. The necessity for the provision of a hot meal at mid-day is therefore plain both on educational and other grounds.

Necessity for this in rural districts.

Measures taken in Dumfries District.

How this necessity has been met in the rural district of the South West is detailed in H. M. Inspector Mr. D. Thompson's report.

In 55 schools soup kitchens have been established at which hot soup can be obtained by each pupil at the cost of one halfpenny, the maximum amount payable by a family being a penny halfpenny. The provisions are supplied and the charges met largely by voluntary contributions, but to some extent by school concerts. At 12 other schools tea, coffee and other light refreshments are supplied, and Mr. Thompson mentions two cases in which specially good work has been done in this matter by the teachers.

Insufficient feeding.

In the same district an enquiry was made in order to discover to what extent children were insufficiently fed. Such cases were reported from 23 schools (12 in Dumfriesshire, 3 in Kirkcudbright and 8 in Wigtown), and they involved about 300 children. Insufficient feeding was always combined with insufficient clothing. After giving the causes of the destitution Mr. Thompson notes that the teachers are of opinion that voluntary efforts are quite adequate to cope with it, and that it is often found that improper feeding does more harm and is more common than insufficiency of food.

Blind, Deaf Mute and Defective Children.

The Blind and Deaf-Mute Children of Glasgow continue to be cared for on the same lines as formerly. They are generally educated at large central institutions for the purpose—the Blind at the Royal Asylum for the Blind, and the Deaf at the Glasgow Institution for the Deaf and Dumb at Mount Florida. From the

Glasgow: history of Special Schools.

Annual Report on School Attendance by the School Attendance Committee of the School Board of Glasgow I quote the following interesting historical paragraph showing the development of the beneficent work carried on by this Board in connection with mentally and physically defective children :—

"One of the most noteworthy features of the present report is the increase in the number of classes for defective children. The first class for mentally defective children was started in Oatlands School in 1898. Two years ago the class was transferred to Hayfield School. The first class for physically defective children was started in the Queen Margaret College Settlement, Elliot Street, in 1901, as an annexe to Finnieston School. Since then centres for mentally defective children have been opened in the following schools, viz :—Camlachie, Finnieston, Grove Street, Calton, Bridgeton, Dennistoun, Dobbie's Loan, London Road, St. Rollox, and Shield's Road, and for physically defective children in Woodlands Institute, Bridgeton, Hayfield, London Road, Grove Street, St. Rollox, and Shield's Road Schools. There are 443 children on the roll of the mentally defective classes and 463 on the roll of the physically defective classes."

Govan: provision for Defective Children.

Reference has already been made (see section on School Supply) to the excellent provision which is being made at Ibrox under the Govan Parish School Board for a further extension of their special schools for Defectives. Their new school in the Partick District, mentioned last year, is now in full working order, and the number of pupils on the roll at the end of the school year (June) was 90. The classes for mentally defective children at Broomloan Road and Church Street Public Schools are carried on as in former years. They had a total roll at the end of the school year of 31 pupils.

Renfrewshire: H.M. Inspector *Mr. Munro Fraser.*

From H.M. Inspector Mr. Munro Fraser's Report I take the following passages which show the growing importance of this part of the work of his District.

"The classes for Deaf Mutes held at the Paisley and Greenock Centres continue to do a large amount of good work. In the Greenock Centre 21 pupils are enrolled, in the Paisley Centre 17.

The pupils enter school at seven or eight years of age and remain till they are about 16. The percentage of attendance in Paisley is very high (exceeding 90 per cent.). In Greenock the attendance is not quite so good, perhaps having been affected during the past year by illness and exceptionally bad weather. . . .

The latest enterprise of the Paisley Board is the institution of special classes for Defective children other than Deaf Mutes The classes meet at present in temporary premises in Abercorn Public School. The pupils are divided into two sections, one for the physically defective (Roll 20), the other for the mentally defective (Roll 17). Very few of the latter have ever been at school before, Most of the children, who are drawn from all sections of the community, are conveyed to and from school in a specially constructed ambulance van in charge of a nurse.

Two specially trained teachers are set apart for the instruction of these classes. Each of the physically defective pupils, of whom most are incapable of much exertion of any kind, receives suitable instruction in reading, writing &c. After dinner, which is provided in school, at midday, all engage in Kindergarten or Manual Occupations, interspersed with Singing, Recitation, &c.

"The mentally defective are very difficult to teach and to discipline. Suitable physical exercises are found very useful in improving their powers of attention, self-control and intelligence, not to mention health. All their

work, including manual occupations, is necessarily of the simplest character. Some have even to be taught to play. A committee of ladies have undertaken to assist the nurse in serving dinner and in entertaining the children in various thoughtful ways. . . .

"It is gratifying to note that although the school has been in operation for only two months, nearly all the scholars show signs of physical and mental improvement."

Report by Miss Monteagle, Bridgeton Special School, Glasgow.

I am once more indebted to Miss Monteagle, the Principal Teacher of the Bridgeton Special School under the Glasgow School Board, for a full and interesting report on the work done for Defective Children in this area. I give below a summary of Miss Monteagle's Report:—

"Three of the special schools in Glasgow have been opened during the past year viz. :—St. Rollox, London Road, and Shield's Road, at each of which there are classes for both physically and mentally defective children. The majority of the physically defective children are observed to be below the normal in intelligence, yet they make very marked progress in all branches of school work. The prevailing physical defect is rickets, and it appears to result from a general lack of nourishment in the broadest sense, including, as well as lack of food, lack of *suitable* food, lack of fresh air, and lack of proper rest; but insufficient nourishment of the body in general implies and includes insufficient nourishment of the brain, hence such children are often backward in school studies. This constitutes a strong plea, not only for feeding such children in school, but also for making all their school surroundings as bright, spacious and airy as possible. The value of space, fresh air and sunshine to these children is so great that it would be well if spaces in some of the public parks were set apart for their use. Such a place as the Glasgow Corporation Estate of Ardkinglas might well, as was suggested last year, be utilised for the purpose, among other things, of establishing holiday homes and schools for Defective Children, to which groups of pupils might be sent with their teachers in turn from the special schools in the city.

"The task of teaching mentally defective children is a difficult but not a hopeless one. Their mental defects do not make them specifically different from normal children, and the study of such children may be made very helpful in understanding the psychology of the normal child. The special schools might, therefore, in some respects be a good training ground for all teachers. The teacher of a special school should to a large extent, be left free to adapt the subjects of the ordinary school curriculum to the pecularities of the individual child. The line of least resistance can often be followed with advantage to such children, and, by giving special attention to a particular aptitude, waste of time and energy may be avoided, and more real progress will result.

"Many of the manual occupations given in the special schools are not only of great educational value, but may also be used in after life as a means of livelihood. When the children attending these schools reach the age of thirteen or fourteen years, such occupations as Cookery, Laundry or Housewifery should be given, for domestic service appears to be the most suitable form of occupation for defective girls after they leave school. Such occupations might, with advantage, be taught even to the older boys as well as to the girls, since there are openings for boys in domestic work in various homes, institutions, and Boarding Schools.

"The sphere of the special schools might be extended to include many children who, while not positively defective, give evidence of that mental torpidity, which is the result of a slowly working ill-nourished brain.

"The Phonic Method of teaching to read has, during the past year, again shown its superiority to the alphabetic method by the actual results obtained in the case of certain children whose work in this subject was specially noted."

Progress in the care of Defectives.

It is evident that the work of teaching defective children is making steady progress in Glasgow, Govan, Paisley and Greenock. It is to be hoped, however, that in many of the crowded centres of Lanarkshire such as Coatbridge, Airdrie, and Motherwell, and in the larger towns of Ayrshire, in all of which there must be many cripple and disabled children, not receiving at present any systematic training, some beginnings of this important and necessary work will soon emerge.

Supplementary Courses.

Statistical Tables.

The statistical table (No. I) relating to these Courses which has been given in the General Report on this Division for the last two years has again been furnished by the Department at my request. By a comparison of the numbers for the three years it is now possible to estimate to some extent both the amount and the rate of progress throughout the Division in certain of the most important elements of educational efficiency, for it is conceded on all hands that the best test of such efficiency is the proportion of pupils who pass through the whole course of the school, and therefore obtain the full benefit of the type of instruction which it affords.

Table No. I, given below, shows the detailed statistics for the whole Division according to Inspectorial Districts, while by reference to Table No. II, in which the chief totals for the three years, 1905, 1906, 1907 are given in series, it is possible to see the total amount of progress made. In Table No. III the increase for the last two years is given separately, with certain percentages from which the rate of progress can, to some extent, be deduced, and in Table No. IV a comparison with relative percentages is made between the number of pupils who, by obtaining the Merit Certificate this year, showed that they had remained a full year in the Supplementary Courses, and the number of pupils in the previous year who actually qualified for entry to such Courses.

The Qualifying Examination.

Before any general deductions are made from these statistics it is perhaps advisable to refer to the fact that the "Qualifying Examination" by which scholars are passed for enrolment in Supplementary Courses (Column 3, Table No. II) is not only the stage at which pupils enter these courses, but that it is also the stage at which pupils are enrolled in Higher Grade Departments or Schools.

Pupils entering Higher Grade Schools.

An estimate of the number of pupils who chose the Higher Grade Course based on the average attendance on which grants were paid in the first year of the Course leads to the conclusion that such pupils form about 24 per cent of the number who qualify. This percentage must be added, therefore, to those who obtain the Merit Certificate when an estimate is made of the whole number who pass beyond the qualifying stage, and spend at least a year in higher work, either in a Supplementary Course, or in a Higher Grade School.

TABLE No. I.

STATISTICS RELATING TO THE WESTERN DIVISION FOR THE YEAR ENDED 31ST AUGUST, 1907.

Number of District.	County or District.	Average Number enrolled.	Actual Average Attendance.	Number of Schools in which Scholars were passed for enrolment in Supplementary Courses.	Scholars passed for enrolment in Supplementary Courses.	Number of Schools in which Grants were paid for Supplementary Courses.	Average Attendance paid grant under Art. 21 (Supplementary Courses).	Scholars passed for the issue of Merit Certificates.
7	Lanark, part of - - -	112,988	97,193	109	6,595	54	2,491	1,222
	Bute, County of - - -	2,798	2,479	16	201	12	90	36
	Total - - -	115,786	99,672	125	6,796	66	2,581	1,258
8	Lanark, part of - - -	91,232	79,133	194	7,294	142	2,869	762
	Dumbarton, part of - -	3,155	2,651	7	234	6	94	4
	Stirling, part of - - -	1,176	1,036	6	119	5	69	23
	Total - - -	95,563	82,820	207	7,647	153	3,032	789
9	Ayr, County of - - - -	49,598	43,446	144	3,822	90	1,820	556
	Total - - -	49,598	43,446	144	3,822	90	1,820	556
10	Dumfries, County of - -	13,147	11,508	77	854	18	309	92
	Kirkcudbright, County of -	6,999	6,153	47	435	20	260	67
	Wigtown, County of - -	5,810	4,972	37	285	11	153	44
	Total - - -	25,956	22,633	161	1,577	49	722	203
11	Lanark, part of - - -	37,129	32,549	34	2,768	24	871	342
	Dumbarton, part of - -	19,239	17,104	36	916	22	376	105
	Total - - -	56,368	49,653	70	3,684	46	1,247	447
12	Renfrew, County of - - -	54,411	47,971	81	3,661	54	1,619	553
	Argyll, County of - - -	11,699	10,356	98	888	78	609	168
	Inverness, Parish of Small Isles	64	50	1	1	—	—	—
	Total - - -	66,174	58 377	180	4,550	132	2,228	721
	Total of Western Division	409,445	356,601	887	28,076	536	11,630	3,974

The percentage of pupils who should qualify.

There is general agreement that, when all the circumstances are taken into consideration, the number of pupils who, in a regularly attended and well taught school can annually be brought to the qualifying stage, should be about 10 per cent of the average number in attendance. If this test is applied to the totals of the Division given in Table No. I, it is found that instead of 35,660 qualified pupils we have this year 28,076 a deficiency of 7,584; but last year the deficiency, similarly calculated, was 12,315, and the previous year it was, on the same basis, 15,198. This undoubtedly represents a very gratifying amount of progress.

A considerable increase

The increase in the number qualifying year by year has been considerable, and the rate of progress shows a steady, but not too sudden, acceleration. If the present rate of advance can be maintained, the deficiency in the number of pupils who qualify, should be practically extinguished within the next two or three years.

The increase in the various Districts.

Each of the Districts within the Division shows, in varying degree, the same result—a large absolute increase in the number qualifying, and a proportionate diminution of the difference between this number and 10 per cent of the average attendance, but the rate of progress in certain districts has been really remarkable. In Lanarkshire District (No. 8), for instance, a deficiency of 3,752 in 1905 has been reduced to 635 in 1907, and the rate per cent in this District is 9·2 of the average attendance. A similar, though proportionately less, reduction has taken place in Ayrshire, where the corresponding figures are 1,843 and 522. The relatively large increase for this year in District No. 7 is also worthy of notice; this increase is nearly six times greater than the increase of the previous year over 1905.

These facts are most clearly seen from the figures given in Table No. II, from which it appears that the total number who qualified last year is 5,161 more than in the previous year, which again showed an increase of 3,270 over its predecessor, while the percentage of the number qualifying to the average roll has risen steadily from 5·63 to 7·87.

This percentage is highest in District No. 8, where, as has already been mentioned, the rate of progress has been most rapid, but from Table No. III, Column (5), it will be seen that in every District this figure is greater than it was last year, and that in several cases it has risen by more than 2 per cent. in three years.

Uniformity of results.

This percentage is very uniform throughout the Division, even more uniform than it was last year. Only in Lanarkshire does it differ to any great extent from the general average for the Division of 7·8, but neither in this county nor in Ayrshire should the increased numbers be attributed to any lowering of the standard of attainment—a subject which will be dealt with in the paragraphs treating of the Qualifying Examination (See Mr. Lobban's remarks on this point in the section on Teaching Staff and Organization).

TABLE No. II.

No. of District.	Year.	(1) Average Number on Roll.	(2) Average Attendance.	(3) Passed for Supplementary Courses.	(4) Average Attendance in Supplementary Courses.	(5) Passed for Merit Certificate.	(6) Percentages of (3) to (2) and of (5) to (4).	
No. 7.								
	*1905	113,359	98,247	5,172	1,673	733	5·2	46·7
Dr. A. D.	1906	114,917	99,233	5,439	2,218	1,169	5·4	52·7
Thomson	1907	115,786	99,672	6,796	2,581	1,258	6·8	48·7
No. 8.	1905	93,660	81,467	4,395	1,934	506	5·3	26·1
	1906	94,260	81,337	5,561	2,239	684	6·5	30·5
Mr. G. Andrew	1907	95,563	82,820	7,647	3,032	789	9·2	26·0
No. 9.	1905	49,422	42,512	2,408	1,011	328	5·6	32·4
	1906	49,132	42,770	3,190	1,278	411	7·4	32·1
Mr. Lobban	1907	49,598	43,446	3,822	1,820	556	7·8	30·5
No. 10.								
	1905	26,233	22,902	1,278	397	123	5·5	30·9
Mr. D.	1906	26,182	22,851	1,510	482	158	6·6	32·7
Thompson	1907	25,956	22,633	1,577	722	203	6·9	28·1
No. 11.	1905	54,580	46,581	2,320	637	237	5·0	37·2
	1906	54,783	48,162	3,072	783	297	6·3	36·6
Mr. R. Harvey	1907	56,368	49,653	3,684	1,247	447	7·4	35·8
No. 12.								
	1905	65,198	56,608	4,062	1,898	577	7·0	30·4
Mr. Munro	1906	65,802	57,947	4,143	2,299	888	7·1	38·6
Fraser	1907	66,174	58,377	4,550	2,228	721	7·7	32·3
	1905	402,596	348,436	19,645	7,545	2,504	5·63	33·1
Totals.	1906	405,076	352,300	22,915	9,299	3,607	6·50	38·7
	1907	409,445	356,601	28,076	11,630	3,974	7·87	34·1

The increase in relation to the Roll.

The total roll of the Division has increased by 4,369, and the average attendance by 4,301. There is, it may be said in passing, evidence of increased regularity in this fact, but it will also be seen that the increase in the number who qualify is very much larger than can be accounted for by the increased average alone. At the rate of 10 per cent. of the average attendance an increase of 430 would have sufficed to make the number equal proportionately to that of last year. but the actual increase is 5,161

* The statistics for 1905 have been adjusted to correspond to the present boundaries of the Districts.

Similarly, in each of the Districts where the roll and the average have risen together, the number qualifying is much greater proportionately than the increased attendance, and this increase in the number of qualified pupils in the Dumfries District where the roll has *decreased*, is all the more remarkable.

TABLE No. III.

[NOTE.—Plus (+) means an increase; minus (−) means a decrease as compared with the previous year. The increase or decrease of 1906 over 1905 is given *in italics*]

(1) No. of District.	(2) Average Number on Roll.	(3) Average Attendance.	(4) Passed for Supplementary Courses.	(5) Percentage of (4) to (3).	(6) Passed for Merit Certificate.	(7) Percentage of (6) to (4).
No. 7.	115,786	99,672	6,796	6·8	1,258	18·5
Dr. A. D. Thomson	*−854* +869	*+375* +439	*+233* +1,357	*+·2* +1·4	*+429* +89	*+7·2* −2·9
No. 8.	95,563	82,820	7,647	9·2	789	10·1
Mr. G. Andrew	*+456* +1,303	*−249* +483	*+1,166* +2,086	*+1·5* +2·7	*+178* +93	*+·8* −2·3
No. 9.	49,508	43,446	3,822	7·8	556	14·5
Mr. Lobban	*−482* +466	*+95* +676	*+772* +632	*+1·8* +·4	*+77* +145	*−1·0* +1·7
No. 10.	25,956	22,633	1,577	6·9	203	12·8
Mr. D. Thompson	*−51* −226	*−51* −218	*+232* +67	*+1·1* +·3	*+35* +45	*+·8* +2·4
No. 11.	56,368	49,653	3,684	7·4	447	12·1
Mr. R. Harvey	*+203* +1,585	*+1,581* +1,491	*+752* +612	*+1·3* +1·1	*+60* +150	*·6* +2·5
No. 12.	66,172	58,377	4,550	7·7	721	15·8
Mr. D. Munro Fraser	*+1,500* +372	*+2,113* +430	*+115* +407	*−·1* +·6	*+324* −167	*+7·4* −5·6
Totals.	409,445	356,601	28,076	7·8	3,974	14·1
	+2,480 +4,369	*+3,864* +4,301	*+3,270* +5,161	*+·9* +1·3	*+1,103* +367	*+3·0* −1·6

Certificate of Merit—a general increase.

If we turn now to the number of pupils who by fulfilling the conditions of the Code have passed for the Certificate of Merit, and who thus complete the curriculum of the Elementary School, we find that in each district, with one exception, the number has increased as compared with last year, though in two districts the increase is smaller than in the preceding year.

A decrease accounted for.

The decrease in the number of Merit Certificates claimed in District No. 12 may, to a large extent, be due to the fact that several new Higher Grade Schools have been opened, both in Renfrewshire and in Argyll, and that in consequence pupils who were formerly in Supplementary Courses are now taking a Higher Grade Course and do not claim the Merit Certificate. This circumstance, which is also true of other parts of the Division (see section on Higher Grade Schools) probably accounts for the apparent slackening in the rate of progress in this particular. The number of Merit Certificates gained in 1906 was 1,103 more than the number in 1905. This year the increase is only 367, but if the explanation suggested is the true one, this does not represent a loss educationally, but rather a gain, as the pupils concerned, if they complete the Higher Grade Course, are receiving more than the equivalent of the training they would have obtained in a Supplementary Course.

Attendance at Supplementary Courses.

There are cases, however—for example the county of Bute—where this explanation does not apply, and where we even find a diminished number of Merit Certificates combined with an increased average attendance in Supplementary Courses. This can only mean that, while a larger number qualify for the Course, and enter it, a smaller number than ever actually stay in it for at least a year. Even in cases where both the number of Certificates and the average in Supplementary Courses have risen together, the increase in the former case is not equivalent to that in the latter. In District No. 7, for example, there is an increase in the number of Merit Certificates of 89, and an increase in the average attending Supplementary Courses of 363, so that while the latter number has increased by 16 per cent. the former has only increased by about 8 per cent. The meaning of this fact is the same as that given to the figures for Bute, but it is on the whole a distinct gain that the actual number who take the Course, though they may not complete it, has risen to so satisfactory a level.

Another Estimate of Progress.

Another method of ascertaining the amount of progress in this respect is shown in the last column of Table II, which gives for three successive years the percentage of the number of Merit Certificates issued to the average number in attendance in the Supplementary Courses. This column shows (1) that as a rule only about a third of the pupils who enter a Supplementary Course remain for a year in it, and (2) that though in almost every district the average attendance in the Supplementary Courses is greater than last year the percentage of pupils who obtain the Merit Certificate is less in every case than in the preceding year; in some cases it is the smallest of the three years. The general significance of this need not be further insisted upon, but it detracts considerably from the satisfaction with which one observes that the total average attendance at the Supplementary Courses is increasing at the rate of about two thousand per year.

TABLE No. IV.

[NOTE.—Plus (+) means an increase ; minus (—) a decrease as compared with the previous year.]

No. of District.	County or District.	Scholars passed for enrolment in Supplementary Courses in 1906.	Scholars qualified for Merit Certificate in 1907.	Percentage.
7	Glasgow, &c. - - -	5,439	1,258	23·1
		+233	+89	+·5
8	Lanark, &c. - - -	5,561	789	14·1
		+1,166	+93	—1·4
9	Ayr - - - -	3,190	556	14·2
		+772	+145	—2·7
10	Dumfries, &c. - - -	1,510	203	13·4
		+232	+45	+1·1
11	Govan and Dumbarton	3,072	447	14·2
		+752	150	+1·4
12	Renfrew and Argyll -	4,143	721	17·4
		+115	—167	—4·2
Totals.	—	22,915	3,974	17·3
		+3,270	+367	+1·0

General results.

When we endeavour to ascertain from Table IV how many of those who qualified last year actually took a course of at least one year's duration, we must add to the percentage given in the last column of this table the general percentage of enrolment in Higher Grade Schools mentioned in the third paragraph of this section. Hence it appears that about 41 per cent (24+17) of those who qualified took at least a year's work beyond the elementary stage. Last year this number was estimated at 40 per cent, and in both cases it is probably under, rather than over, the actual enrolment. It cannot be regarded, however, as a satisfactory general result that at least 50 per cent. of the pupils

who qualify for Supplementary and Higher Grade work do not take advantage of the facilities so widely offered for it. As in last year's returns it is again the case that the proportion of pupils passing through the Supplementary Course is greatest in the Glasgow District, and in Renfrew and Argyll (see last column of Tables III and IV), although in the case of the latter District there has been a decrease as compared with last year.

Satisfactory on the whole as the statistics of the Qualifying Examination are, especially when the large and increasing enrolment in Higher Grade Schools is taken into account, it cannot be denied that the decline in the proportion of the pupils in Supplementary Courses who obtain the Merit Certificate is an ominous sign, for it means that though the number who qualify approaches the desired proportion many will only attend for a few weeks, or, at most, a few months in the Supplementary Course before the legal age of exemption releases them.

Merit Certificates in Wigtownshire.

The very small number of Merit Certificates obtained in Wigtownshire was spoken of last year. In 1905, 46 pupils obtained the Certificate, in 1906 this number fell to 41, this year (1907) it is 44, so that the number of pupils who complete the full Curriculum of the Elementary School, if they were all gathered together, would just suffice to furnish rather more than one full Supplementary class for the whole area. As a matter of fact more than half of the total number of Merit Certificates gained in this County last year were issued to pupils of *one* School, viz., Stranraer Academy. This state of matters is again commended to the earnest attention of the School Boards and Teachers of the County.

Schools presenting 'Qualifying' pupils.

In Table I it will be found that the number of schools in the Division which present qualifying classes has risen from 790 last year to 887 this year, but as the total number of schools in the Division is 1,113 it follows that there are still more than 200 schools in which no pupils are presented at the stage of the qualifying examination. Some of these schools, are, no doubt, very small, and others are Infant Schools, but there still undoubtedly remains a minority which ought to present such pupils. There is a prospect, however, that by another year all schools, from which such presentations may reasonably be expected, will be included in the list.

Schools with Supplementary Courses.

The number of schools which have Supplementary Courses shows a corresponding increase; last year there were 450 such schools, this year the number is 537.

District No. 10 (Dumfries, &c.)

The increase in schools presenting pupils has been very marked in District No. 10, where 41 schools have been added to last year's list, and 16 more schools than last year have begun work in Supplementary Courses, three of them being in Wigtownshire. The proportion of schools having such Courses is still, however, smaller in this District than in other parts of the Division, of which it may be said in general that about half the schools in each district afford facilities for Supplementary Instruction.

Qualifying Examination in Glasgow and Govan.

The number of pupils in the Glasgow Board Schools who passed the Qualifying Examination and are enrolled in Supplementary Courses or Higher Grade Departments, continues to show a satisfactory increase. There has also been a steady rise during the past three years in the number of Merit Certificates issued annually for such pupils. The table given below will show the exact figures for each year. Similar statistics are not available for the schools of the Govan School Board, but the numbers qualifying and the number of Merit Certificates issued during the past year are given in the Board's Report on School Work. From this it appears that 2,424 pupils qualified, and that 318 Merit Certificates were issued. Even after the necessary deduction has been made from the number qualifying, on account of pupils enrolled in Higher Grade Departments, the total of Merit Certificates is not by any means large, and in certain schools under this Board, *e.g.*, Fairfield P.S., where no Merit Certificates were issued, it is extremely unlikely that *all* the pupils who qualified either would, or should, enter the Higher Grade Department of the School, since this implies that they are prepared to take a full three years' course of Intermediate Education.

Glasgow Board Schools.

Year.	Number of pupils qualified under Art. 29.	Number enrolled in Supplementary Courses and Higher Grade Schools.	Number of Merit Certificates.
1904	2,341	3,668	695
1905	3,698	4,076	620
1906	4,123	4,252	916
1907	5,137	4,968	1,002

The Examination under Art. 29, "Qualifying Examination."

With regard to the Qualifying Examination itself there seems to be no doubt that a good deal of misapprehension as to its place, its function, and its standard has existed. The result of this was as H.M. Inspector Mr. G. Andrew remarks :—

"That a ridiculously small proportion of the pupils were receiving the benefit of Supplementary work before leaving school, and that many of those who reached this stage turned 14 after being only a few months in the Courses. If there is one text from which we have been preaching day in, day out, during the past year it is this :—that all pupils of average ability who attend well and behave well, should have spent at least a year in a Supplementary Course before leaving school, that these courses should be made not aristocratic but democratic, and that if they are to confer the benefit they are capable of conferring on the rising generation, they must be fully participated in by the large majority of the children. The pupils must not be too late in entering them, and the school curriculum must be so framed as to have the pupils ready for the Qualifying Examination at the proper age."

Number of Supplementary Courses.

The reports of the District Inspectors also indicate the marked increase in the number of Supplementary Courses which has taken

place all over the Division, and the fact that a wider conception of the treatment of the subjects of Schedule V, and particularly of English, is steadily gaining ground among the teachers. Several of the Inspectors draw attention to the circumstance that home reading consists too exclusively of fiction, and urge that travel, biography and Natural History might receive more encouragement. I am inclined to agree with this; there is a type of boy to whom narratives of actual adventure—such books, for example, as Lord Roberts' "Forty Years in India," Trevelyan's "Cawnpore," Fitchett's "Account of the Mutiny," Nansen's "Farthest North," Smiles' "Lives of the Engineers '—make a stronger appeal than fiction of the most classical type, and books of this class should find a place in every well-furnished school library.

Practical Instruction in Supplementary Courses.

There is equal agreement, however, that, except in the large centres, the practical side of the instruction has received little, if any, development. On this point I quote from H.M. Inspector's Report on Lanarkshire:—

"The most important point in connection with Supplementary instruction in Lanarkshire at present is this: There is great danger of one-sidedness; the education imparted is becoming too bookish; . . . . True we are teaching the pupils how they may enjoy their leisure, but we are pointing too directly at leisure. . . . In other words it is necessary to insist on practical work of a suitable type being more generally adopted in the industrial centres.

and H.M. Inspector Mr. Lobban in his Report on the Ayrshire District has the following paragraph:—

"With regard to the work of the Supplementary Classes as a whole, I think we may fairly claim that they are fulfilling all reasonable expectations as far as the ordinary subjects of instruction are concerned. But it seems to me that matters are now ripe for an extension of their usefulness, and that the inclusion in the scheme of work of some form of practical training should be compulsory in all but exceptional cases. In the larger centres there is no difficulty in providing facilities for instruction in Woodwork, Cookery and Laundry Work. In many rural districts, I am convinced, the same subjects could be introduced without much trouble and at little cost. The additional rooms required for the purpose need not be expensive structures and a group of schools could be served by the same teacher."

The neglect of this practical side of the instruction is alluded to by H.M. Inspector Mr. Munro Fraser in connection with one marked case:—

"Port-Glasgow, a shipbuilding centre of note, has as yet no centre for Industrial training, and, in a new central school that is shortly to be erected, the provision of a workshop has been deliberately omitted from the plans."

H.M. Inspector Dr. A. D. Thomson on the other hand has a very satisfactory statement to make in this regard in the case of Glasgow:—

"The Glasgow Board has this year instituted important changes in the arrangements for Supplementary Courses. A uniform industrial course is now the only one in Glasgow Schools. This is a step in the right direction, for the industrial course is certainly more educative than the commercial."

Practical Instruction in Rural Schools.

The case of practical instruction in the Supplementary Course in rural schools presents greater difficulties. A course of Cookery including some instruction in practical housewifery is in every

way as desirable in rural as in urban districts, but, until Boards can be got to combine to secure the services of peripatetic teachers, or until the difficulty be solved by an enlargement of areas, there is little hope of much progress in this direction. Certain subjects, however, suggest themselves as lying ready to the willing and resourceful teacher's hand, even as matters are at present. Land measuring was traditionally a subject of instruction in many of the Parochial Schools in Scotland, and there seems no reason why it should not continue to be so. With the wider diffusion of classes for practical training instituted by the Provincial Committee under Article 55 of the Regulations, there need be few teachers unqualified to impart practical training in some form of manual instruction, such as Woodwork. No great outlay on the side of equipment is necessary to start this branch of instruction in any rural school, given the necessary skill on the part of the teacher. With a bench or two in the corner of a classroom capital work can be done with the few boys at the Supplementary Course stage. A school in Argyll alluded to by H.M. Inspector Mr. Munro Fraser is an instance of what can be done in this way. Schoolmasters in upland districts are often expert bee-keepers. Training in this art would form an admirable side of practical instruction in connection with the Supplementary Course; it would be at once interesting, instructive and stimulating to the pupils, and it would be capable of being made profitable in their ordinary life. It may be remarked incidentally that an enthusiastic teacher can, by his skill, give to a branch of knowledge of this type a wonderful stimulus to a whole district.

H.M. Inspector Mr. G. Andrew in his report on Lanarkshire makes the following statement:—

"In the small rural schools we press on the teachers the advisability of introducing practical land measuring for boys, and in a few cases this is being well done, and appreciated by parents. At least two of our country head masters are skilled apiarists, and in their schools the boys are fully instructed in the art of bee-keeping."

Navigation in Sea-coast Schools.

In insular and sea-coast districts Navigation is a subject which seems especially fitted for the practical side of a Supplementary Course. H.M. Inspector Mr. Munro Fraser refers to this:—

"In Argyllshire there are approximately 36 Commercial Courses, 16 more or less Rural Courses, two Navigation Courses, and five Courses of an industrial character. It is evident that in this county the number of rural and Navigation Courses could be largely increased."

It is remarkable that over the whole of this district with its wide sea-coast there appear to be only two schools where Navigation is taught. If this is due to inability on the part of the teachers, there seems to be an excellent field for a practical class in this branch under Article 55 of the Regulations.

Rural Supplementary Courses. Relation to Agriculture.

There can, however, be no question that the all-important industry of the rural districts is Agriculture, and the crux is how to bring the instruction given to the older pupils at the Supplementary Course Stage into direct contact with it. During

the past year the lack of any direct relation between the teaching of the schools and the future employment of boys and girls who are to spend their lives in country districts is a question which has been again and again pressed on my attention; and a motion was brought up by a prominent member of the Ayrshire County Council that the attention of the Department should be drawn to this clamant need in connection with the teaching of our rural schools.

School Gardens.

If the instruction is to be of any real value it must be practical, and, so far as the boys are concerned, probably the best side from which it can be approached is that of a properly equipped school garden.

A proposal by the Department.

The course, which I understand your Lordships intend to adopt, namely, to place funds at the disposal of the several Agricultural Colleges enabling them to send into each county one or more experts, who are to get into touch with the young farmers, and with the teachers, and to give assistance in the formation of properly equipped gardens at the rural schools, and instruction to the teachers as to their management, will probably result at an early date in better planned and better taught rural Supplementary Courses.

Suggested graduation of Grants for Supplementary Courses.

So strong seems to be the feeling of the District Inspectors as to the need for the development of this practical side, that more than once allusion is made to the question of whether a graduated payment of grant under Article 21 should not be considered. There can be no doubt that the Board which earns the liberal grant at present allowed at the cost of buying a few books, and giving the pupils in addition to their course in English a little practical Geometry and so-called Commercial Arithmetic—doing in fact little beyond what it was customary to do in the old sixth or ex-sixth Standards—hardly deserves to be paid at the same rate as the Boards who have provided, in addition to other subjects, well equipped courses of practical instruction for boys, and of Cookery, Laundry and Practical Housewifery for girls.

Alleged "marking time" in School.

One frequently hears the remark made that for a year or more before children reach the exemption limit of fourteen, they are simply "marking time" in school, and would be deriving greater benefit both on the utilitarian and the moral side by being engaged in some form or other of ordinary every-day work. If this be so, if children are simply "marking time" in school, and have contracted a dislike to its discipline, the fault undoubtedly lies with the school. The children get wearied because they are not being interested, and the course of instruction at this stage must be specially adapted in the case both of boys and girls to fall in with the process of transition from childhood to youth which at this stage is rapidly progressing; they no longer respond so readily to the formal methods of *ex cathedra* teaching suitable for earlier stages, and they long to employ their minds

and their hands independently, and one way in which this longing can be satisfied is by their employment in some form of practical work.

English in the Supplementary Course. Study of Shakespeare.

In some of the District Reports allusion is made in connection with the English Study of the Supplementary Courses to the view that the pupils ought not at this stage to be introduced to the study of Shakespeare, but that poetry of a simpler and more objective type, such as the narrative poems of Scott, is, at least in the first year, to be preferred. This point was alluded to in last year's Report in connection with the Higher Grade Schools, and it is one deserving consideration. It may naturally be expected, however, that, in every intelligently directed school, pupils will have some acquaintance with Scott before the Supplementary Course is reached, and further, it has to be remembered that, in the case of Supplementary Course Pupils, their only chance of receiving an intelligent introduction to Shakespeare occurs at this stage. The judicious teacher, however, will here, just as in the case of a Higher Grade Class, be careful in the selection of the play taken up, and, generally, if he knows his business, will adjust both the prose and poetry selected for study to the capabilities of his class.

Supplementary Courses for Girls.

H.M. Inspector Mr. Munro Fraser emphasises the importance of the Supplementary Class teaching of girls being in the hands of a highly cultivated lady teacher. I am in the heartiest agreement with him, and I quote his remarks at length:—

> "In our ideal school a large part of the training of the girls in a Supplementary Course should be given by a lady teacher. She knows, as no man can know, their modes of thinking, their special needs and aspirations. She can talk of the books they read with more freedom than a man, and can appeal to sentiments of which he is ignorant. In the greater as well as in the lesser moralities of life, the personal influence of a cultured and refined woman exerts a 'double sway.' It is, therefore, satisfactory to note that in schools where the girls are numerous enough to form a separate class, their instruction in the Supplementary Course is mainly in the hands of lady teachers. The difficulties in the way of this arrangement in small schools are great, but not in all cases insuperable. Needlework is a woman's subject and the teacher of it is usually one of the ordinary trained staff. It should be possible to utilise her services in at least a part of the work of the Course."

Higher Grade Schools.

Number of Higher Grade Departments.

The Higher Grade Departments received such full treatment in the General Report of last year that it seems unnecessary to make any lengthy reference to them at present. It may be mentioned, however, that at the close of the session of 1907 there were 65 Higher Grade Departments or Schools in the Division Since then the following have been added, viz:—Dalmellington, Troon, Kilwinning, and Stevenston in Ayrshire, Tobermory, Lochgilphead and Tarbert in Argyllshire, and Johnstone in Renfrewshire.

All these have been provisionally recognised as from the beginning of the current session 1907–8.

Supply of Higher Grade Instruction.

Over the Division as a whole the supply of Higher Grade Departments is reasonably adequate, particularly so in Ayrshire, Lanarkshire (including Glasgow and Govan), Dumbarton and Renfrew. In certain of the insular parts of Argyll it will probably be advisable to allow certain schools, without conferring Higher Grade status on them, to present pupils for the Intermediate Certificate, provided the necessary attainments are shown. This might be found a fairly satisfactory solution for schools like Port Charlotte and Portnahaven in Islay; the school of Port Ellen in this island ought certainly, in my opinion, to have a properly organised Higher Grade Department similar to that already existing at Bowmore. Recognition of the kind indicated has already been accorded to Inverary Public School, and I understand the Department is also to grant such recognition to Tigh-na-bruaich School where very satisfactory work of an advanced type is done. If a properly organised Higher Grade Department cannot be equipped at Tiree, some such arrangement as that described above might be found possible there. In Ayrshire, Ballantrae is in a similar position, and here also similar provision might be made. In Wigtown, some opportunity for obtaining the Intermediate Certificate should be provided in the Whithorn District. Negotiations with a view to this were entered into about a year ago between the Board and the Department, but they were broken off through the unwillingness of the Board to provide any additional buildings or staff. This was all the more disappointing in view of the fact that an addition to the Public School was being made at the time for the purposes of elementary instruction. The district of Gatehouse-on-Fleet is an isolated corner of the Stewartry in which some provision is also desirable. It, too, was visited a year ago at the request of the Local Boards, but difficulties, arising mainly from the peculiar boundaries of the School Board areas of Girthon and Anwoth, seemed, for the time, insuperable.

In the majority of the Higher Grade Departments throughout the Division the instruction will not go much beyond the Intermediate Stage. So far, however, as it does go, it can be confidently said to be growing in fulness and improving in its general quality. The teachers are getting a firmer grasp of the main scope and aim of the instruction.

The smaller Higher Grade Centres.

At several of the new centres the number of pupils completing the three years' course leading up to the Intermediate Certificate will be relatively small, but the ample provision which is being made, notably at Troon, Stevenston, Kilwinning and Dalmellington, will provide admirable equipment for the pupils taking a Supplementary Course at these Centres. Such pupils, both boys and girls, will there receive a much fuller and more suitable training on the practical side than formerly.

Classes for the Further Instruction of Teachers.

(Article 55 of the Regulations).

H.M. Inspector Mr. F. W. Young, reports on these classes as follow:—

"During the past session Teachers' Classes provided by the Glasgow Provincial Committee have been in as great demand within the Western Division as in previous years. The following tabulated statement will serve to show that in comparison with 1905–6 the number of teachers in attendance at Classes in Experimental and Biological Science had appreciably increased, while in Drawing there was a slight corresponding diminution.

1.—EXPERIMENTAL SCIENCE.

	1905–6.			1906–7.		
	Nos. enrolled.			Nos. enrolled.		
	1st Yr.	2nd Yr.	3rd Yr.	1st Yr.	2nd Yr.	3rd Yr.
Lanark County, Hamilton Academy	–	–	–	13	–	–
Lanark (Glasgow), Anderson's College Medical School	23	–	–	22	–	–
Lanark (Glasgow), Our Lady and St. Francis	18	20	11	–	–	–
Lanark (Glasgow), R. C. Training College	28	–	–	42	–	–
Lanark (Glasgow), West of Scotland Tech. Coll.	12	5	–	28	15	7
Lanark (Glasgow), Woodside P. School	14	9	10	5	–	9
Renfrew, Paisley St. Margaret's Convent	17	–	–	22	19	–
	112	34	21	132	34	16
Grand Totals	167.			182.		

2.—NATURAL SCIENCE.

	1905–6.			1906–7.		
	Nos. enrolled.			Nos. enrolled.		
	1st Yr.	2nd Yr.	3rd Yr.	1st Yr.	2nd Yr.	3rd Yr.
Bute, Millport Marine Biological Station: Botany	13	–	–	–	–	–
Ditto: Zoology	7	10	6	13	7	9
Glasgow Technical College: Botany	–	–	–	16	–	–
Lanark, Hamilton Academy: Botany	–	–	–	21	–	–
	20	10	6	50	7	9
Totals	36			66		

3.—DRAWING

	1905–6.			1906–7.		
	Nos. enrolled.			Nos. enrolled.		
	1st Yr.	2nd Yr.	3rd Yr.	1st Yr.	2nd Yr.	3rd Yr.
Ayr, Ayr Academy	29	25	–	34	28	–
Kilmarnock Academy	17	–	–	16	–	–
Dumbarton, Dumbarton (B) Academy	5	10	5	2	7	4
Lanark (County), Airdrie Academy	13	16	15	20	16	13
Lanark (County, Hamilton Academy	14	25	20	18	17	14
Lanark (Glasgow), Glasgow School of Art	74	101	292	–	165	302
Lanark (County), Lanark Grammar School	15	17	–	14	5	–
Lanark (Glasgow), Adelphi Terrace P. School	46	–	–	32	–	–
Lanark (Glasgow), Kent Road P. School	114	–	–	107	–	–
Lanark (Glasgow), Provanside P. School	94	–	–	71	–	–
Lanark (Glasgow), High School	–	–	–		73	–
Lanark (Glasgow), Pupil Teachers' Institute	115	110	–	161	–	–
Lanark (Glasgow), Whitehill P. School.	–	29	–	–	25	–
Lanark (Glasgow), Our Lady and St. Francis	22	9	–	42	–	–
Renfrew, Paisley Technical College School of Art.	9	7		4	4	4
Renfrew, Paisley St. Margaret's Convent.	21	25	–	29	20	–
Govan, Bellahouston Academy.	–	–	–	18	–	–
	588	382	332	568	360	337
Grand Total.	1,302			1,265		

4.—WOODWORK AND CARDBOARD MODELLING.

	1905–6.			1906–7.
	Nos. enrolled.			Nos. enrolled.
	1st Yr.	2nd Yr.	3rd Yr.	1st Yr.
Lanark, Hamilton Academy	11	2	–	23
Renfrew, Greenock Holmscroft H. G.	13	–	–	–
	24	2	–	23
Totals	26			23

"The work in all the classes has been strongly marked with all the good features referred to in the previous reports—earnest and skilful guidance given by the instructors; eager and diligent application leading to very satisfactory progress on the part of the Teacher Students, who have, as a general rule, fully availed themselves of the opportunities for improvement in special branches provided for by the Provincial Committee. A promising feature is to be found in the relatively large numbers in attendance at 2nd and 3rd year classes In the Glasgow School of Art alone 302 were enrolled in the third consecutive year of study. Of these 37 have taken the course (Post Diploma), of the 4th year, 18 of the 5th year and nine of 6th year. 196 Students of the 3rd year submitted their Drawing Portfolios for the Public School Teachers' Drawing Diploma, and 153 were considered of sufficient merit for the award. For the first time a special class in Art Needlework was instituted for Post Diploma Students. Seldom has any Art Class been more fully successful in all its work. The satchels of work, the portfolios of drawings and the final inspection exercises were, almost without exception, highly praiseworthy. It is to be hoped that this class will exercise a healthy and progressive influence on Art Needlework, as practised in Continuation Classes, where the work hitherto done has been of a somewhat unsatisfactory nature owing largely to the want of sufficiently skilled teachers.

"Short Christmas Holiday Courses in (*a*) Drawing and Painting Life and (*b*) Painting Still Life, were conducted in the Glasgow School of Art by the Director and Professor Greiffenhagen. The Students were, most of them, Art Masters in Secondary Schools, who showed the greatest interest and enthusiasm in their studies.

"The Summer Holiday Courses in the Glasgow Technical College this year were more than usually successful. The subjects and attendance were as follows:—

1. Experimental Physics	27
2. Experimental Chemistry	23
3. Practical Botany	14

"Each Course lasted for three weeks, giving a total of 75 hours instruction The great majority of the Students were teachers from Intermediate and Secondary Schools desirous of meeting the Science requirements of the Department by making themselves familiar with modern methods of work, and more particularly of obtaining practice in the use of instruments, and as they all possessed some knowledge of the subjects studied, progress was rapid, and to the entire satisfaction of the Instructors and Inspectors of the Department."

Conclusion. In bringing this Report to a close I am well aware that there are many points of interest which conditions of space have made it necessary to omit. We are, and have been for the last few years, in a period of transition, but one notes with satisfaction that the end of this period is at least in sight. The public mind as a whole, and more especially that section of the public—an ever-growing section—which takes an active interest in educational matters, is steadily becoming familiarised with the organisation which it has been the work of the last ten years to formulate. The notion has been prevalent that a revolution was taking place in educational arrangements. The idea is now gaining ground that, not a revolution, but a gradual evolution has been in process—an evolution which, when fully developed, will put Scotland in possession of an educational organisation adapted to satisfy on every side its educational needs.

In conclusion I desire to make very special acknowledgment of my obligation to Mr. J. H. Murray, Junior Inspector, for valuable assistance in the compilation of this Report.

I have the honour to be,

My Lords,

Your Lordships' obedient Servant,

A. R. Andrew.

To the Right Honourable
The Lords of the Committee of Council
on Education in Scotland.

APPENDIX TO GENERAL REPORT, 1907.

WESTERN DIVISION.

Report on Cookery and Laundry Work by Miss Crawford, Inspectress.

Cookery.

Glasgow.

"During the past year 41 classes in this Division were visited, 10 of which were taught by members of the ordinary Staff. The number visited, however, represents but a fraction of the classes in operation. In the city of Glasgow alone at least 43 trained teachers of cookery are employed, and to keep in touch with a staff of this magnitude is well nigh impossible. Happily the necessity for inspection in the city is minimised, as the work is so ably and systematically arranged and supervised by the Lady Superintendent, Mrs. Crighton Davies, to whose capable management and guidance is due the high standard of efficiency and generally good work throughout the city. It is of much importance that a large centre like Glasgow should take the lead in a subject such as this, for all over the West and South of Scotland, teachers follow very closely the methods and rules adopted by the Teachers of the city.

"The uniformity of Syllabus adopted within recent years by the Glasgow Board is a guarantee to some extent for systematic, practical, and applicable work. The lessons of this syllabus are, as a rule, closely followed, though occasionally a divergence for no special reason is met with. As far as I am aware, every cookery class room in the city is provided with a coal range or stove, with gas stove as an adjunct. The rooms resemble as closely as possible an ordinary kitchen, and are not used as general class rooms.

"The excellent nature of the teaching, the enthusiasm evinced. and good work done by the pupils in some of the schools in the poorer districts of the city merit the highest praise. No effort is spared to render the instruction of the greatest possible use to the pupils, upon many of whom devolves at a very early age the entire management of the home.

Housewifery Classes.

"The classes for Housewifery continue to give satisfaction, though in this direction there is room for further development, the training in this branch of work completing, as it were, the whole range of domestic subjects.

Govan.

"Some well equipped class rooms have been attached to the new schools under the Govan Board, but in many of the older schools the accommodation is unsatisfactory.

Maryhill Cathcart. Helensburgh.

"Special cookery rooms have been included in the new schools recently erected by the Maryhill and Cathcart Boards; while in Dumbartonshire an excellent centre for all the pupils in Row Parish has been annexed to Helensburgh Clyde Street Public School.

Jamestown.

"The class room to be used for cookery at Jamestown Public School is meantime undergoing reconstruction, and a similar reconstruction is very necessary at Bonhill Public School.

Ayrshire.

"In Ayrshire there has been an increased number of classes during the past year.

"In Kirkcudbrightshire the subject has been introduced into several of the rural schools and successfully taught by a member of the staff qualified to give the instruction. Kirkcudbrightshire.

"Wigtownshire possesses but one class that, namely, at Glenluce Academy. Wigtownshire.

"A spare class room has been reconstructed and set apart for Cookery at Dumfries (Landward) Noblehill Public School, and much good and useful work is anticipated. Throughout the Southern Counties generally, the subject is not taught to any great extent, particularly in rural schools, where it is calculated to be of much benefit. The expense incurred in securing a teacher deters many Boards from introducing it. This difficulty however, could meantime be solved, if adjoining Boards would engage a peripatetic teacher for the work of the district, her time and services to be allocated according to circumstances. Dumfries Noblehill P.S.

"In Argyllshire an active class was seen for the first time at Tigh-na-bruaich Public School, where the Infant Class Room, with stove, tables and cupboard introduced, is meantime utilised. The lessons are satisfactory, but not so the class arrangements; and it is hoped that the Board will at no distant date erect a proper room where this work can be carried on with less disturbance to the general work of the school, and with more comfort and convenience to teacher and pupils. A spacious and well equipped room is attached to Lochgilphead School and the work here promises well. Argyllshire. Lochgilphead.

"At Oban High School an extension of premises is urgently necessary to enable the instruction to be carried out with greater efficiency, and on principles approaching in some degree to the conditions of home. The teaching given meantime is as good as can be expected under existing conditions; but, until more accommodation is provided, the best results cannot be attained. Oban.

"At Campbeltown the pupils from the Grammar and the Elementary Schools attend at the 'centre,' namely, the Hall of Lorne Street U.F. Church. It is not an ideal cookery room, but it has been adapted as far as possible to meet the requirements, and much successful work is being accomplished. Campbeltown.

"Throughout this Division there are many other classes where good work is being carried on, reference to which was made in my report of last year."

Laundry Work.

"More classes for Laundry Work are in operation in this Division than in the other two combined:—

"In Glasgow city and neighbourhood many of the schools are equipped with laundry class rooms, while, in the less thickly populated districts, one class room has been erected and adapted for both cookery and laundry work. Glasgow.

"I have not been privileged to see many classes in operation during the year, but, where the work was in progress on the occasion of my visit it has invariably been most favourably commented upon.

"Although the habit of giving out the family washing is becoming only too common, the advantages derived from a course of lessons in this subject are very great. The girls are not only initiated into the art of washing and dressing, but indirectly it has a decidedly elevating influence on them. Careless and slovenly habits begin to disappear, and pupils become more self-respecting in matters connected with the person and home. In addition also the general instruction and practice in handling the materials and elements is in itself valuable, and, with Cookery, this subject forms a substantial foundation upon which girls can base their future careers.

EDUCATION (SCOTLAND).

SOUTHERN DIVISION.

GENERAL REPORT FOR THE YEAR 1907,

BY

A. E. SCOUGAL, Esq., M.A.,

HIS MAJESTY'S SENIOR CHIEF INSPECTOR.

Presented to both Houses of Parliament by Command of His Majesty.

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1908.

[Cd. 4063.]

SOUTHERN DIVISION.

Comprising the Counties of Berwick, Clackmannan, Dumbarton (part of), Edinburgh, Fife, Haddington, Kinross, Linlithgow, Peebles, Perth (part of), Roxburgh, Selkirk, and Stirling (part of).

Population - - 1,229,983.

Inspectorial Staff.

1 Chief Inspector.
9 Inspectors.
1 Junior Inspector.
2 Sub-Inspectors, 1st Class.
5 Sub-Inspectors, 2nd Class.

GENERAL REPORT *for the Year* 1907 *by* A. E. SCOUGAL, ESQ., M.A., *His Majesty's Senior Chief Inspector of Schools in Scotland, on the* SCHOOLS *in the* SOUTHERN DIVISION OF SCOTLAND.

January 1908.

MY LORDS,

I have the honour to present to Your Lordships my fourth Annual Report on the Schools in the Southern Division of Scotland.

Staff Changes. Retirement of H.M.I. Mr. Barrie.

Since the date of my last Annual Report the following changes have taken place in the Inspection Staff of the Division. On 25th March, 1907, H.M. Inspector Mr. Barrie gave up the charge of District No. 2 and retired from the service under the age limit. Mr. Barrie had held office as one of H.M. Inspectors of Schools for thirty-six years. For a short period after his appointment he assisted the late Dr. Charles E. Wilson in the inspection of schools connected with the Free Church of Scotland. After the passing of the Education (Scotland) Act of 1872 he was advanced to the charge of the Dumfries district, which he held for nearly twenty-seven years. In 1899 he was transferred to the charge of the Haddington district, which he held till his retirement. During this long period Mr. Barrie had proved himself an able and efficient officer—sound in judgment, loyal to the Department, fair and considerate in his treatment of managers and teachers. H.M. Inspector Mr. Clark was transferred from the Perthshire district to succeed Mr. Barrie. Until Mr. Clark took up his duties on 17th September, the work of the Haddington district was overtaken by the staff of the Edinburgh district. The vacancy in Perthshire was filled by the transference from the Stirling district of H.M. Inspector Mr. Millar, whose place at Stirling was taken by H.M. Inspector Mr. Fraser, who had been on the general staff of the Division. Mr. Fraser was succeeded by H.M. Inspector Dr. Walter Stewart, who had previously been associated with H.M. Inspector Dr. Macnair in the Science and Art work of the Division; and Mr. James G. Frewin was appointed a Junior Inspector to fill the place vacated by Dr. Stewart. Mr. John Wilson, Sub-Inspector of the Second Class in the Stirling district, was promoted to be a Sub-Inspector of the First Class, and transferred to the Renfrew-Argyll district, to take the place of Mr. Binnie, I.S.O., retired; and Mr. Bell, Sub-Inspector, was moved from the Border

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district to Stirling. The vacancy in the ranks of the Sub-Inspectors of the Second Class has been filled by the appointment of Mr. Donald J. Macleod, who has been temporarily posted to the Edinburgh district; and assistance is in the meantime being given to H.M. Inspector Mr. Fleming in the Border district by the Edinburgh staff.

The retirement of Mr. Barrie deprives me of his report; but, as far as school work is concerned, the report furnished by H.M. Inspector Mr. Jamieson covers the work seen by him and his junior colleagues in the Haddington district as well as in the Edinburgh district.

School Supply and Accommodation.

In my General Report for last year I enumerated the chief causes which now necessitate an increase or modification of school accommodation. The remarks which I then made are still applicable. Under pressure of the same causes, Managers throughout the Division have shown considerable activity in the enlargement or alteration of buildings and in the erection of new buildings.

Edinburgh District. *Mr. Jamieson.*

In the Edinburgh district Mr. Jamieson mentions as the chief improvements in school supply: (1) The opening by the School Board of Edinburgh of the Gilmore Place Public School, which is a very large and handsome building; (2) the institution by the same Board of the Special School for Defective Children at Willowbrae; (3) the reconstruction of Bathgate Academy, which was partially destroyed by fire; (4) the completion by the School Board of Bo'ness and Carriden of the large new school at Grange. The last-mentioned school will do much to solve the difficulties of accommodation and organization with which the Board has long had to contend. Mr. Jamieson also refers to the agreement reached between the School Boards of Edinburgh and of Leith (B.) regarding the education of the children who live near the boundary line between the city and the burgh. This agreement will clear up the difficulty at Granton Public School, which has for some time been acute. As the result of the opening of Gilmore Place Public School, West Fountainbridge Public School, the buildings of which had long been unsatisfactory, has now been closed.

The Roman Catholic Managers of Edinburgh and its vicinity have recently instituted a Higher Grade School and Junior Student Centre, known as the Holy Cross Academy. This new school, which is situated just within the burgh of Leith, is intended to meet the wants of Roman Catholic Higher Grade scholars and Junior Students not only in Edinburgh and Leith but also in the country round. Arrangements have been made for boarding a certain number of pupils. The opening of this school has involved the closing of Edinburgh, Albany Street, St. Mary's Roman Catholic Higher Grade and Elementary School. The latter school, though interesting and well conducted, had long been defective in respect of buildings. In District No. 2 the most important building improvement completed before the end of the session

was the enlargement of Musselburgh Grammar (Higher Grade Public) School.

In the Fifeshire district H.M. Inspector Mr. Smith points out that every class of the population is represented except the shepherd and the crofter, and he proceeds to explain the complexity and variety of the problems presented in a study of the necessary school supply. Over the mining belt of Fifeshire the population is increasing rapidly; over the eastern half of that belt in particular it is increasing with great rapidity, and the Boards concerned have difficulty in keeping pace with it. The Wemyss Board, especially, has to cope with an enormous task, and is doing so vigorously. In the manufacturing towns—in Dunfermline, that is, and Kirkcaldy (with Dysart) — progress, though steady, is less rapid. "In Dunfermline," Mr. Smith continues, "the supply is for the moment adequate to the demand; and I may so far digress as to say that in respect, not only of school provision, but of equipment, staff, and general efficiency, the burgh of Dunfermline need fear comparison with no town in Scotland." In Kirkcaldy a large new school has been built this year and a similar school is building at Dysart. In the fishing towns, on the other hand, the population is stationary, while from the purely rural districts it is slowly ebbing away. In these parts, therefore, there has been no need to press for accommodation, except where a building has had to be condemned; but in the improving or equipment and the readjustment of buildings Mr. Smith says that there has been a good deal to do, and that there remains not a little to be done. In the fishing communities the problem is complicated by the unstable condition of the staple industry, which a turn of the trade may send elsewhere. Mr. Smith concludes this section of his report with a list of five new schools built, building, or to be built; of seventeen existing schools to which additions have been made, are making, or are to be made; and of fifteen schools on which improvements have been made, without, however, increasing the accommodation; and he says that minor alterations have been too numerous to mention. Fifeshire District. *Mr. Smith.*

After a reference to the settlement of the school building difficulties at Hawick and Jedburgh, and to the new building at Eyemouth in which cookery and laundry are taught, H.M. Inspector Mr. Fleming (Border District) points out that, as the population of his district is stationary or decreasing, the supply of school places may, in general, be regarded as sufficient, but that there is need for considerable expenditure on equipment and on the improvement of buildings. Reconstructions or additions will need to be made not infrequently on account of the changed conditions of the staff. He also urges that the outlay necessary to an adequate development of practical work should be courageously faced. In his district there are many schools in which the fittings, such as desks, need to be renewed; and he considers that, with regard to heating and ventilation, few of his schools entirely satisfy Border District. *Mr. Fleming.*

the requirements on which the Department now insists in the case of new schools. Mr. Fleming is of opinion, however, that recently a great improvement is taking place in matters of sanitation and hygiene, and he describes in detail the methods employed to awaken the interest of managers and teachers in these questions, giving special prominence to the enlightened regulations drawn up by the School Board of Cavers for the guidance of the cleaners of the Board's schoolrooms and offices.

Perthshire District. *Mr. Clark.*

H.M. Inspector Mr. Clark (Perthshire district) reports that, by reconstruction and enlargement, Aldgirnaig General Assembly School has been made practically a new school; that a small new school has been erected at Achnafree; and that additions have been made, or are being made, to the schools of Pitcairngreen, Kinclaven, Kinfauns, Muthill, Perth (Southern District), Perth (Western District), and Stormontfield. With a view to providing suitable accommodation for a Higher Grade School the managers of Dunkeld Royal Public School have carried out structural alterations on the buildings. Plans have been submitted for a new central school at Kenmore, and for the enlargement of Comrie and Strathfillan Public Schools. It is understood that, as the result of a plebiscite, the School Board of Comrie now propose to erect a new school. The Perth School Board are preparing plans for a new school in the Northern District. The question of accommodation at Craigend Public School, of which mention was made in Mr. Clark's last report, has not yet been settled by the Perth (Landward) School Board. The question is complicated by the fact that a large proportion of the children in attendance come from Forgandenny parish; but the two Boards should be able to arrive at an agreement on the lines indicated at their joint conference with Mr. Clark in August last.

Stirling District. *Mr. Millar.*

H.M. Inspector Mr. Millar remarks that in the Stirling district the problem of keeping the supply of school places abreast of the increase of population does not present any peculiar difficulty. The population increases, but not rapidly; and though there has been considerable activity in providing new premises during the year, the new buildings have in a good many cases been due solely to a rise in the standard of consideration for the health and comfort of the pupils. In the mining part of the district, however, there have been one or two examples of large additions necessitated by a sudden increase of population. A handsome new school, with a central hall and light, airy rooms, has been erected at Kinross, while the old buildings remain available for practical instruction in connexion with the Supplementary Course. Camelon School, under the Falkirk School Board, having been partially destroyed by fire, has been rebuilt, with a light and spacious central hall. At Banton (Kilsyth Landward School Board) the existing premises have been completely reconstructed. The same thing has happened at Aberfoyle Public School, where the accommodation is now ample and of excellent quality. At Kilsyth Academy a large

addition has been built for the needs of the new Higher Grade Department. The St. Ninian's School Board have had to cope with a considerable increase of population, and "have shown their usual energy and foresight." A handsome new school, with a central hall, has taken the place of the old building at Cambusbarron. The single room of which Fallin School consisted now forms part of a well-designed school accommodating 300 pupils. The junior department of Bannockburn Public School has been very successfully enlarged and reconstructed; and the Roman Catholic School in the same parish has been largely extended and greatly improved. A considerable addition has also been made to the Roman Catholic School at Stirling. A small addition and some internal and external improvements have been made at Avonbridge Public School. Trossachs Public School has been enlarged and greatly improved. A new school is in progress at Airth, and extensive additions and improvements have been carried out at St. Ninian's Public School, Stirling.

The foregoing summary, compiled from the reports of H.M. Inspectors in charge of districts, is evidence that, in providing the material conditions which successful teaching demands, school managers throughout the Division have not been inactive.

Feeding and Medical Inspection of School Children.

School meals.

Reference is made by some of my colleagues in the Division to the arrangements in operation in some localities for supplying soup or cocoa to the scholars in the middle of the day. In all cases where such an arrangement exists H.M. Inspectors find that the effects are good; and in most cases the scholars make a small payment for what they receive. But such attention to the physical needs of the children is not at all general. At present provision of this kind must depend entirely on private initiative, and, where such meals are supplied, the success of the arrangements seems to be mainly due to the solicitude of the teacher.

Medical inspection of schools.

Except in Edinburgh and Fifeshire medical inspection has hardly been attempted. Last spring the School Board of Edinburgh took an important step in appointing as their Medical Officer Dr. John H. Meikle, who is to give his whole time to the medical supervision of their schools. Similar appointments had previously been made by the Merchant Company of Edinburgh for the Secondary Schools under the Company's management; and since the institution of the College for Physical Training at Dunfermline the medical inspection of children attending schools under the Dunfermline Board has been carried out by the medical officers attached to the college. H.M. Inspector Mr. Smith has devoted considerable attention to this subject, and I shall quote this section of his report *in extenso* :—

In Fifeshire: *Mr. Smith.*

"I have addressed enquiries to all my correspondents to ascertain what arrangements are being made for the feeding and medical inspection of the children. The answers are disappointing. The question of feeding the

School meals.

children is in this county mainly a question for the rural schools. In the numerous burghs and villages which dot 'the populous shores of Fife' the children as a rule are able to get home for their mid-day meal; and, as a rule, it is there for them. There are really no slum schools in Fife; there are doubtless many poor people; but of real penury, of grinding poverty, so far as I have seen, there is little. 'Our children,' writes one of my reverend managers, 'are all well fed and well clad.' Long may they so continue. But there are many country schools from which the children cannot get home at mid-day, and where much good may be done by supplying a warm meal at school, at least during the winter months. At present Boards cannot charge such items to the school account; but there are obvious facilities which, even at present, Boards may legitimately offer; and the members might do something in their private capacity to initiate such movements. Once started, and aided by some contributions in kind, they are self-supporting. At Forgan, for example, where the children bring their own bread and are charged ½d. per head for soup, there is an annual surplus of some 30s. But it must be said that this satisfactory result would not be achieved if it were not for the generous aid given by the teachers. And, generally, one finds that, whoever may have started the soup-kitchen, its success in the long run depends above all on the generous aid of the teachers. This aid, I am sure, is ungrudgingly given. But the number of places at which soup-kitchens have been started is disappointingly small. They exist at Auchterderran, Cardenden, Burntisland, Halbeath, Ferry-Port-on-Craig, Forgan, Kirkton of Largo, Leslie, Gateside, and (Dunfermline) St. Margaret's Roman Catholic School. At Flisk, too, they supply cocoa, tea, or coffee; and the clerk tells me that since this arrangement was made, colds and minor ailments have greatly decreased during the winter months. All credit to these schools. But what a miserable total—eleven schools out of 146. The main reason why there are so few is indicated with some *naïveté* by a reverend correspondent:—'On the subject of feeding and medical inspection of the school children, the Board'—I tell not its name—'have taken no action beyond being unanimously opposed to the cost of the former being placed upon the rates.'

Medical inspection.

"Medical inspection is in a still more backward state. Thanks to the Carnegie Trust, the Burgh of Dunfermline enjoys probably the most thorough system of medical inspection to be found in Scotland. It is carried out by two doctors—one of them a lady—in a manner far too scientific and minute for me to attempt to describe here. Elaborate measurements and other statistics are taken and recorded. It is to be noted that the system is voluntary; but the tact and skill with which it is administered have in almost all cases secured the free consent and co-operation of the parents. Townhill Public School, though under the Landward Board, participates in the Burgh system. Satisfactory arrangements have also been made at Kirkcaldy. The inspector's duties there do not appear to extend to measurements and statistics. Three of the Dysart Board's schools are in Kirkcaldy Burgh, and are inspected accordingly; at my suggestion the Dysart Board has arranged for similar inspection of their remaining school; but as they have allowed only two guineas for the work, their conception of the duties involved would not seem to be very exigent. Beyond these there are no arrangements made anywhere for medical inspection except in the Parish of Ceres. There the Chairman of the School Board is also medical officer, and visits the schools periodically. By next year some of the larger Boards will, I hope, have been induced to follow the example set by Dunfermline."

In the Border District: *Mr. Fleming.* School meals.

On the same subjects H.M. Inspector Mr. Fleming reports:—

"In a very few cases in the county arrangements are made to supply a cup of hot cocoa for the children in winter and for this the children make a small payment. To the teacher is due all the credit for initiating and carrying out this arrangement. Of the benefits of this it is difficult to say too much.

"As far as I am aware no medical inspection of school children is made in this district: no records or measurements are made of their growth or development, nor is there any dental inspection. Medical inspection.

"Precautions taken against the spread of infection are not yet in all cases adequate. A good many schools suffered this year from epidemics. The school authorities are perhaps not to blame in this matter, for parents appear to be very careless: but this laxity argues a lack of knowledge about such matters, for which state of ignorance the educational authority must be to a certain extent responsible. In one case mumps were carried from one school, which had been closed for this reason, to another by children who had flitted at the May term. It certainly seems not right that such a thing should occur, and it appears reasonable to demand that a certificate of freedom from infection should be presented by children on entering a new school. Precautions against infection.

"With regard to the whole question of hygiene, I regret to say that there appears to be general diffidence about it."

Attendance and Exemptions.

All my colleagues discuss this subject in their Reports, and it is clear that they have very carefully studied the facts of a somewhat perplexing question. Perhaps the healthiest policy would be to aim at securing a fairly high percentage in all schools rather than to seek after "records" of perfect attendance, the attainment of which may depend largely on accident. I have considerable sympathy with Mr. Jamieson's view that in cases where the attendance steadily reaches 90 per cent. it would probably be unwise to press for greater regularity. Insistence on perfect attendance may lead to various evils, and observation does not suggest that the children who are never absent are always the best scholars. As this is a matter in which districts differ greatly, I shall quote my colleagues' remarks without attempting to summarize. Dangers in connexion with aiming at 'perfect' attendance.

H.M. Inspector Mr. Jamieson gives in his Report the following notes with regard to School Attendance in the Edinburgh District:—

"On the whole, the state of matters in regard to school attendance in the Edinburgh District is fairly satisfactory. In the city more than 15 per cent. of absenteeism is the exception. In the country the state of matters varies with the locality. In the mining districts it is often exceedingly bad, but even there one finds notable exceptions, as in the case of Broxburn Public School, where a very high average is regularly attained. Attendance in the Edinburgh District: *Mr. Jamieson.*

"It is perhaps natural that among the Infant Classes attendance should be reduced during the winter. Our climate is too often productive of days when it would be inhuman to send a child of five to a school two miles distant. Infant classes.

"On the other hand, it is generally quite inexcusable that pupils over ten should be constantly irregular, and in most cases these are the worst offenders. The excuses given are usually trivial, and, as a rule, the blame rests with the parents, who keep the children at home to run on errands or assist in household affairs. One could mention schools in which 90 per cent. of the pupils in particular classes absent themselves on, at least, one day per week. Pupils over ten.

"Apart from compulsion, several methods might serve to mitigate the evil, as, for instance:—

"1. The enforcement of good attendance during the early years of school life, with a view to the formation of a habit in pupil and in parent. Methods to secure improvement.

"2. The establishment of a school-interest in parents, by means of occasional informal meetings between teachers and parents, preferably in school while the pupils were engaged in some suitable occupation.

"3. Co-operation between the Board and the Medical Officer. At present a busy country practitioner has little time to issue certificates in all cases where temporary absence is necessary. It might be practicable, however, for the headmaster to call on the doctor, at short intervals and learn from him what children—usually they would be few—had genuine reason to be absent through illness. Apart from illness, valid excuses are very few. Be the actual method of co-operation what it may, the sympathy of the Medical Officer should be secured.

Compulsory officers. In rural districts;

"Both in town and country much hard work is done by compulsory officers, but in the country the range of action for individual officers is often too wide. Cases occur where the most an officer can do is to visit each school neighbourhood once a fortnight. Such a visit may suffice where attendance is normally good, but where the opposite is the case it might be good policy for the Board to arrange for daily visitation in the affected locality for an extended period. Increased grants would probably more than make good the increased expense.

in the city.

"In the city, too, the work of the officers would be much more effective if they were attached to *schools* instead of to geographical areas. It is frequently the case that a headmaster gains information regarding absent pupils at second, third, or fourth hand. Much time would be saved, and much clerical work avoided, were each officer attached to a very small group of schools, and required to report daily, morning and afternoon, to the headmasters of these schools. At present a week usually elapses between the receipt by the officer of instructions to visit and the intimation to the headmaster of the reason for absence. It is the opinion of the headmasters of large schools that at present each officer has more schools to deal with than he can properly overtake.

Exemptions.

"In most cases, Boards have been judicious in the granting of exemption. One or two in Linlithgowshire have erred conspicuously in this respect, granting exemption to one-fifth of the pupils eligible. It may be that parents prevail on the Board by means of tales more pathetic than true: the state of the wage-earner in mining districts is not at present unprosperous. Here, also, the sympathy and assistance of the Medical Officer are invaluable.

H.M. Inspector Mr. Smith reports:—

Attendance in Fife: *Mr. Smith.*

"Taken all over, *Attendance* in Fife is pretty good, but not quite good enough. The latest available statistics show that the percentage for the county is almost exactly equal to the general percentage for Scotland. Since I wrote this the statistics for 1906 have come to hand and show Fife fractionally lower than the average for Scotland, thus: Fife, 87·2; Scotland, 88·07. But a county so thickly peopled, with so many towns and villages, should not rest content with being no worse than the general average for Scotland. To condescend upon details, of my 146 schools:—

1	has made	less	than	75	per	cent.	
6	have made	between	75	per cent.	and	80	per cent.
30	„	„	80	„	„	85	„
73	„	„	85	„	„	90	„
35	„	„	90	„	„	95	„

and 1 has made over 95 per cent.

"The wooden spoon (71·8 per cent.) falls to Brighton Public School—a dejected little school a mile from Cupar. The first place is taken (with 95·5 per cent.) by Dairsie Public School—some two miles on the other side of Cupar. Next to Brighton's bad eminence come Balmullo, Collessie, Kinglassie, Kinghorn Infants, Dunino, and Leuchars. In some of these cases, *e.g.*, Leuchars, epidemics account for the lowness of the figure. It will thus be seen that, in round numbers, half the schools are satisfactory, a quarter are below the average and a quarter are above it. But when one seeks for the causes of these divergences, the search is baffling. Why, for example, should the attendance in the Burgh of Dunfermline be 5 per cent. better than the attendance in the Burgh of Kirkcaldy? Here is a more extreme instance:—Dairsie and Balmullo are two country villages, little more than

Curious divergences.

two miles apart and with little apparent difference in their social and economic conditions except this, that many of the Balmullo villagers are devoted to small-fruit culture. The percentage of attendance in Dairsie was 95·5: in Balmullo it was 75·4. If the difference is due to small-fruit culture, it is a dear price to pay for early strawberries. But, generally, such divergences in conditions apparently identical can only be explained in a way that is not creditable to the zeal of the teachers, the Boards, or the compulsory officers concerned. On this question of attendance some other points occur which are worth remark.

Migratory populations.

"Over part of the mining belt, and still more in the rural parishes, the population is extremely migratory. This, indeed, is the curse of the country school, and countervails most of its undoubted advantages. The ploughmen do not move very far, but they are always moving. In a country school it is no uncommon thing to find that one-third of the pupils are new every Martinmas. The results are deplorable. A boy who is thus knocked about from school to school loses in the aggregate well-nigh two years of school life; for besides the inevitable waste of time involved in transference, he is apt to snatch an unlicensed holiday both before and after the 'flitting.' The time from Martinmas to Christmas is thus largely frittered away. To this is mainly due the high proportion of over-age children whom we find in some of the mining and the rural schools. I speak not of other, and perhaps graver, consequences that this nomadic habit brings in its train.

Potato-lifting.

"Another problem which confronts the rural Boards is the demand for child-labour at the potato-lifting season. The common solution is to divide the vacation, taking part in summer and part in the late autumn. But this plan has drawbacks. The younger children are not wanted in the fields, and the season is too late for holidaying. Accordingly, this plan is being gradually abandoned and the Boards are adopting instead the policy of granting exemption for potato-lifting to pupils over twelve who apply for it. No doubt there are drawbacks to this plan also, inasmuch as some of the teachers are left nearly empty-handed. But on the whole it is the more excellent way. It reduces the annual percentage, but that is largely an objection on paper; as against which it gives the Boards a useful lever for forcing up the attendance at other seasons of the year by refusing to grant exemption unless a certain percentage has been reached.

Education Act of 1901.

"Finally, the Act of 1901 has had one consequence which its authors can scarcely have anticipated. With the raising of the compulsory age to fourteen, parents of a certain class have lost that interest in regular attendance which the prospect of a labour certificate inspired. Consequently one hears complaints that the attendance is worst among the oldest pupils. In particular the older girls are often kept at home on Fridays, for the whole day or for half the day, to help in house-work.

Exemptions.

"*Exemptions* are not, I am informed, so rife in this district as they used to be, but they are still granted too lavishly. Here, as in the case of attendance, inexplicable anomalies are found. Why, for example, should the School Board of Kirkcaldy grant 44 exemptions and the Dysart School Board 49, when the Dunfermline Burgh School Board finds it sufficient to grant 14? Why 18 exemptions at Leven; only 4 at Buckhaven? Why from the small school of Kettle, with 211 on its roll, are there 11 exemptions, while at the neighbouring and larger Ladybank Public School there are none? Apparently, different Boards interpret this duty with very different degrees of stringency. It is in the mining districts, of course, that the demand is largest, and is most lavishly conceded. The reasons are obvious. Boys of thirteen can at once earn a considerable wage in the pits, especially where they assist their fathers in 'oncost' work. Moreover the miners, making good wages, marry young and rear large families, so that by the time the eldest boy is thirteen he often has five or six younger brothers or sisters. So the claims for exemption are very numerous and the Boards find them hard to resist. In Lochgelly Public School, with a roll of 1,572, no fewer than 53 exemptions were conceded

last year. By way of comment I will simply set against these figures the figures for Glasgow, where in the year 1905 the School Board over the whole of that immense district granted only 98 conditional and 179 complete exemptions. Exemptions in Fife are generally made conditional on attendance at Continuation Classes; but the attendance of exempts is not good; they habitually drop off the moment they reach fourteen; and last year the Lochgelly Board was weak enough to exempt girls on condition of attendance at Needlework only, because they refused to go to Division I."

H.M. Inspector Mr. Millar reports :—

Attendance in Stirlingshire, &c.: *Mr. Millar.*

"In speaking of the question of regularity of attendance some years ago I said I thought a general average of 90 per cent. was about the best that could be hoped for under existing conditions. It is gratifying to observe from the attendance returns for 1906 that for that year the county of Clackmannan had a percentage of 92·24, the county of Stirling a percentage of 90·59, and the county of Kinross a percentage of 89·73; for the small portion of Perthshire which is included in the inspection district, the percentage is probably somewhat lower; but, taking into account the distribution of population between the different parts of the district, the percentage for the whole district is probably very slightly higher than that for Stirlingshire —probably 90·7 per cent. This satisfactory result is due first and foremost to the exertions of the teachers, who have taken up the task of encouraging regularity of attendance as a part of their daily duties. Their enthusiasm has, of course, reacted upon the Managers, and, though it may at first sight seem hard that teachers should have to add this to their already multifarious duties, it is eminently a case in which virtue brings its own reward, for increased regularity of attendance makes the whole work of the school not only better, but easier. In the session 1906–07, four schools had a percentage of 95 or over. The friendly emulation between the two neighbouring schools of Bonnybridge and Dennyloanhead led to the establishment of two remarkable records, 97·7 per cent. in the case of Dennyloanhead and 96·2 per cent. in the case of Bonnybridge; the other two schools were small country schools, Gleneagles with 96 per cent. and St. Ninian's Muirland with 95 per cent. Sixty schools in all made 90 per cent. or over."

Average very satisfactory.

H.M. Inspector Mr. Clark reports :—

Attendance in Perthshire: *Mr. Clark.*

"The following statistics indicate the nature of the attendance in the district :—

26	schools	had a	percentage	of	average	attendance	of	90 or over;
62	„	„	„	„	between	85	and	90;
34	„	„	„	„	„	80	„	85;
8	„	„	„	„	„	75	„	80;
5	„	„	„	„	„	70	„	75.

Owing to the severity of the weather in the early months of the year, and rather more than usual epidemic sickness, the general average for the district is slightly lower than last year. The attendance in Perth city shows improvement—the percentage over all the schools being 87·1, but it should be better. In the six largest towns outside Perth city the average percentage is 86 per cent. The attendance at Blairgowrie Public School, Pitlochry Public School, Alyth Episcopal Church School, and Crieff St. Columba's Episcopal School should be higher. The worst offenders are certain rural schools in purely agricultural districts. A complete indifference to regularity of attendance on the part of both parents and managers appears to prevail in some quarters, and is particularly noticeable at the period of the year between the summer vacation and the potato holidays. The low attendance for weeks at that time reduces the percentage of average attendance for the year considerably."

Places where improvement is needed.

Withdrawals without exemption.

"The withdrawal of the children without exemption certificate for purposes of employment, farm labour, 'beating,' etc.—has still to be complained of. In some cases the difficulty might be overcome by a change in the date of holidays.

"In the matter of exemptions one or two Boards have been too liberal this year, but the Boards generally take care to limit the exemptions to the most necessitous cases." Exemptions.

H.M. Inspector Mr. Fleming reports :—

"Attendance may be considered fairly satisfactory. The average of the whole district works out this year at 86·8 per cent. as against 87·3 per cent. last year, and 86·7 per cent. the year before. Bad storms in the winter, and the prevalence of sickness in some parts, account for this slight falling off. This year forty-two schools show a percentage of 90 or over, as against forty-eight last year, but what is perhaps more satisfactory eight only have failed to reach 80 per cent. as against eleven last year. Of individual schools, Yarrowford Public School has made the wonderful record of having 98·5 per cent. of children in attendance throughout the year. Two schools made over 96 per cent., two over 95 per cent., one over 94 per cent., and six over 93 per cent. These figures are highly creditable. But I think it is reasonable to ask Managers not to rest satisfied until a 90 per cent. average is reached in normal years, and only under very exceptional circumstances should a percentage of less than 90 be shown. Attendance in the Border District: *Mr. Fleming.* Improvement, on the whole.

"As I write I have before me the official Report of the schools in Stockholm for this year, and from this it is seen that the average of absentees was 6·07 only, which gives practically a percentage of attendance of 94. Of this 6·07, as much as 4·07 was due to sickness, ·01 only being given as the figure of those absent without reason, while actually 5,490 children out of a total of 24,549 were never absent—a percentage of more than 22. I am afraid it will be some time before we can show such figures as these." Comparison with Stockholm.

"Though exemptions in this district are not numerous, they are numerous enough to give rise to the suspicion that in some cases a little more stringency is needed. In country schools I find that of those who left school, 7 per cent. were exempted as against 6 per cent. last year; but in truly rural districts very few were exempted. In Hawick, 13 per cent. as against 15 per cent. last year; in Galashiels, 12·5 per cent. as against 10 per cent.; and in Selkirk, 27 per cent. as against 30 per cent." Exemptions.

Organization and Classification.

In my General Reports for last year and for the preceding year I devoted considerable space to a discussion of the importance of judicious classification and systematic promotion. My colleagues have given much attention to the subject and continue to urge its importance. From their remarks it is clear that, while much progress has been made, much yet remains to be done. There seems to be unanimity of opinion that time is often lost in the Junior Division of the school. But as the remarks made by H.M. Inspectors amount mainly to a corroboration of what I said in the two previous Reports, it does not seem to be necessary for me to repeat my arguments, or to quote remarks which support those arguments. If there are still indications next year of imperfect classification, I shall then return to the subject. Reference to preceding Reports.

Ordinary School Subjects.

From all the districts of the Division improvement is reported : (*a*) in the range of reading and in the methods employed in teaching infants to read; (*b*) in the instruction given in English Composition; (*c*) in the means adopted to give children clear and useful ideas on arithmetic. H.M. Inspectors have devoted very special attention to these matters during the past four years, and their General improvement in certain points.

efforts have been aided by the Memoranda on the teaching of elementary subjects issued by Your Lordships. In some districts during the past two years an attempt has been made to render the teaching of Geography and History more intelligent and effective, and the indications are that a more thoughtful treatment of the subjects is becoming much more general. The comments made by my colleagues on ordinary school work are so suggestive and so well put that I shall quote from their Reports somewhat extensively. Owing to the other demands of official work on my time during the past session, I have had very little opportunity of seeing the work of the Primary Schools for myself or of making joint visits of inspection along with my colleagues who are in charge of the several districts of the Division. It seems best, therefore, that I should let each of these colleagues speak for himself in regard to the general condition and the special features of the school work in his own district. While adopting this year this plan, I desire it to be understood that, except where there is express indication to the contrary, I am in entire agreement with the comments, criticisms, and suggestions made by the colleagues whom I quote.

Mr. Smith. H.M. Inspector Mr. Smith reports :—

"Nowhere, in an experience now growing fairly extensive, have I met with better material than the Fife teachers find ready to their hands; nor, I must add, with greater keenness than those teachers as a body display. Whatever industry can do is, as a rule, done. Oral work in all subjects, but particularly in English, is decidedly above the average. Written work is not so good; the slate still holds its ground in many schools, and, apart from penmanship, the art of correcting errors and the use of models for teaching Composition are imperfectly understood. In Arithmetic, modern methods are being rapidly diffused. Nature Study flourishes; so in a way does Drawing, for which almost all the teachers have now qualified, thanks to an excellent County Committee. (There are only three schools in Fife that do not claim the Drawing grant.) But the work is still too largely from the flat. In History and Geography we wait for official Memoranda to move the waters. In Physical Exercises the official syllabus now holds sway everywhere, and time tables have been adjusted accordingly. Most of the teachers have had a course or courses under Article 55 of the Regulations. Dunfermline has a great advantage here, with the College to draw on; but Kirkcaldy has also engaged a visiting expert; and the County Committee is now following in physical culture the policy which I have described as adopted by it for disseminating a knowledge of cookery—*i.e.*, it engages experts and lends them out to Boards. Singing is a strong subject in Fife, but there is a tendency to weed out the "timmer" voices far too drastically and turn the class into a select choir. We have felt bound to insist that Music is a school subject like Reading, and that the teacher's duty is to give every child as much as he can take in. There are some who are physically incapable of profiting by the music lesson, tone-deaf children, just as there are colour-blind children or cripple children who could not be taught to paint or to dance. But the number of children who are really tone-deaf is probably not more than 1 or 2 per cent."

Mr. Millar. H.M. Inspector Mr. Millar reports :—

"In the various subjects of instruction I have to report that progress continues to be made on the lines described in previous reports and indicated in the Memoranda issued by the Department. It is not always easy to note much change from year to year, but, looking back over the four years that have elapsed since the introduction of Supplementary Courses, one cannot

fail to be struck by the general improvement that has taken place in the method and in the spirit of the work. It is difficult to speak accurately in general terms about the work of a district, which is not a homogeneous entity, but a collection of units, each taking its colour from an individual headmaster or headmistress. Thus, though one may speak of a general movement forward, it is not to be supposed that anything like a uniform rate of progress is implied. On the contrary, the difference of the rate of progress in different schools is one of the things that strike one most forcibly. The restrictions imposed by the old system of individual examination and payment by results tended to a certain degree of uniformity; great differences no doubt there were, but, I should think, much less than the differences between the best and the worst schools of to-day. There are some improvements it is true which have been almost universal; few schools have been unaffected by the general improvement in staffing and equipment—partitioning of classrooms and the like; few perhaps have been entirely unaffected by some of the improvements in method—the greater range and better quality of reading matter, the use of paper instead of slates for the written work, better methods of teaching Drawing, better methods of teaching the initial stages of Reading; but when all is said there remains a residuum of schools which relatively at least have made but little progress. The introduction of Supplementary Courses has been one of the most potent factors in raising the general level of the work, not in the Supplementary Class alone but throughout the school, but there are many schools which have not yet developed a Supplementary Class, and to which neither the spirit nor the letter of Circular 374 has yet penetrated, except in such reflected gleams as may be derived from an Inspector's too infrequent visits."

H.M. Inspector Mr. Clark reports :— *Mr. Clark.*

Reading. "Steady improvement is being made in the methods of work in English, and the instruction is gaining in intelligence and breadth. The *Phonic method* of teaching children how to read is to be found in a few more schools this year. As this method becomes more general, ease in reading at sight will be a more common feature of the subject throughout the district, and the difficulty of securing a good course of literature in the Primary School from the Infants' Division onwards will gradually be lessened. In the meantime so much time has to be expended, through the adoption of obsolete methods, in getting the children to read with moderate accuracy and fluency, that the side of English instruction which can open up the child's mind and help to form his tastes and character receives but scant attention. Something is done, it is true, in the region of poetry, but even there, from haphazard selection of material and perfunctory repetition, the value of poetry as a formative instrument is frequently lost.

Oral Composition. "Oral Composition is being treated in a more systematic way in many of the schools, with the result that in the lower classes as well as the higher greater readiness and accuracy in the use of spoken English are discernible. It is refreshing to get in country schools where one used to complain of the shyness of the children, fairy tales, stories from history, and the simple narrative of the reading lesson reproduced freely and frankly. In large schools the difficulty of oral training is increased by the size of the classes, as each child must be made to feel the responsibility of taking his or her own share in reproduction. Consequently one often finds in the case of large classes either a select few who can talk readily and tell fluently what they know of a story, or classes where the reproduction is a mere memory recital. In such cases the teachers have not realised the advantage of subdividing a large class into sections for practice in conversation and oral reproduction.

Written Composition. "The standard of written Composition is much the same as last year. With the fulness that comes from wider reading, a gradual improvement may be looked for in the quality of the matter. As for the form, it is frequently loose and careless—a result which it is rather difficult to reconcile with effective teaching. To judge from the number of carefully corrected

exercises much time and care are evidently devoted to the subject. But there does not appear to be sufficient stress laid on: (1) a careful elimination of errors in the ordinary speech of the children and in the class oral reproduction; (2) a systematic grouping of corrections at the various stages in the curriculum around grammatical principles, so that the children in the junior stages may unconsciously absorb the grammar and prepare for the more formal grammar lessons which should come in the senior classes; (3) the working out of models on the blackboard with a full discussion of the 'why.'

Arithmetic. "Very good progress has been made in the methods of Arithmetic. The Infant and Junior Divisions are working for the most part on sound lines, and rapid improvement has been made in the Senior Division. The majority of teachers have given successful attention to the inculcation of a knowledge of the *rationale* of the various processes, and to the neat and orderly arrangement in logical sequence of the written work. Problems that used to be worked out solely by the 'rule of three' are now reasoned out by the application of 'first principles,' and much more importance is attached to short methods and oral work. Altogether Arithmetic is much more intelligently taught and understood, and has a more practical bearing.

Geography. "In a few schools the instruction in Geography proceeds on excellent lines. In most of the schools it may be said that the pupils obtain a fairly detailed knowledge of the physical features of the world. But through lack of suitable illustrative material, that knowledge is presented and acquired in an uninteresting way, and frequently amounts to little more than unfamiliar names. The teaching requires to be directed more into the channel of *cause and effect* in climate, race characteristics and distribution, means of communication and interchange of productions; and the value of such exercises as map reading, map drawing from memory, and the filling up of outline maps as the study of a country or continent proceeds, has still to be realised.

Drawing. "The majority of the schools were visited this year by Mr. Duckett, from whose Reports I gather that some progress has been made in the district in realising the aims and methods of Primary School Drawing."

Mr. Fleming. H.M. Inspector Mr. Fleming, discussing the quality of the staff and the quality of the instruction under one head—the two things are indeed inseparable—writes of the state of matters in the Border District as follows:—

The head teacher and the assistant teachers. "That many teachers, and many assistant teachers, are at once able and skilful goes without saying. All, I believe, are conscientious and hard working. But too many, particularly of assistant teachers, are but poorly equipped for their work. It is perhaps not necessary to show why, and there is now the prospect of better times. But the effects of the present system are depressing in the extreme. Again and again the hard work of a head teacher is of no avail to overcome the bad training given by an assistant. The influence of the head teacher, too, is somewhat limited. As a rule, he is simply the 'class-teacher' of the highest class. With his time taken up with class work, and with the many extra duties which fall to his lot, it is not possible that he can exercise satisfactory supervision over the work of the school; and he can hardly be held responsible for the work done, or the methods pursued in other classes. In small schools with a limited staff it is not reasonable to expect that the head master should be released from class work, but it is reasonable to expect that the head master should not be burdened with this work in many of the larger schools. At present it is rare in this district to find a head master who is not in charge of a class; and I have no hesitation in saying that in many schools he should be free. This is a reform very urgently needed, particularly when the calibre of so many of the assistant teachers is as low as it is. . . .

"The feeling that a teacher must have something to *show off* in his class at the day of examination is a time-honoured institution that still flourishes.

Consequently, there is the too constant revisal of work done; the re-reading of books stale at the first perusal; the never ending series of sums all of the same kind, until at last the consummation is reached, when the child has been turned into a second-rate Ready Reckoner.

"On the negative side there is the suppression of all activity, the dullness of the daily round, and the absence of all that partakes of the nature of play. What wonder is it then that the child is glad to escape from school as soon as possible, that Continuation Classes in rural places cannot be formed, that interest in education is practically nil?

Progress slow. "While it is possible to say that in many cases reformed methods of instruction in school subjects have been adopted with enthusiasm and success, on the whole progress has been very slow, and only too often things go on much in the same old way. . . .

English. "In the subject of English a commencement is being made with the study of literature. More reading is done, and of a more varied kind. Standard Readers are, in my opinion, still too common, but in many cases a good selection of supplementary reading is gone through. In the infant room teaching to read on the Phonic system has been introduced in several schools with such success that the example is being followed by others. But the conspicuous fault is a lack on the part of the pupils of the power of oral expression. . . . Not enough effort is put forth to cultivate English speech. It is true a beginning has been made to get children to reproduce orally stories read or told to them. This is good enough in its way, but every lesson of the day affords opportunity for speech, and those opportunities are not used. . . . Too much insistence cannot be placed on the principle that children must speak freely, readily, and with precision; if they can do that, Composition will come naturally and easily.

Arithmetic. "In Arithmetic the old system and old methods have received a severe shaking. In the meantime the results in many cases are not as good as they will be. Text books on modern lines are generally used, but are often misused through being employed without due attention to the degree of advancement of the class. . . . Practical work is being introduced, rulers, weights and measures are beginning to be used; and doubtless before long, better results will be obtained.

Geography. "In Geography, too, it can be said that a beginning has been made with the treatment of the subject on the new lines. The Ordnance Survey map has been introduced in several schools, and attention is being given to the physical side of this study. But in the great majority of cases the old order continues.

History. "History is the least satisfactory subject. Of all subjects of the school curriculum no subject requires greater knowledge on the part of the teacher than History; yet, with some brilliant exceptions, the ordinary teacher's knowledge of History is but meagre. What knowledge he has is too often confined to a limited aspect of British History. Even thus, the average teacher is the slave of the text-book, and often seems to work but a page or two ahead of his class. For History teaching, the text-book should be of little moment. Some skeleton in the hands of the pupil is perhaps desirable, on to which the teacher can frame the body of the subject and make it live; and unless the teacher is so steeped in the subject as to be able to do that, and be independent of the text-book, the instruction he gives will not, as a rule, be of much account. There is constant clamour for a history text-book. The text-book needed is some standard work in the teachers' hands. . . . Of apparatus to teach History, such as reprints of pictures, there is scarcely any to be seen.

Nature Study. "In not a few cases good work is done in Nature Study, and good methods are employed. In Selkirk Burgh School some excellent work is done, and the example set there has stimulated others to do the same. On the other hand, in too many cases the old manner of treating this subject is prevalent. One thing that tells against progress is the mistaken idea of many teachers as to what is the end or aim of this instruction. The real aim of this study

is the search after knowledge, not necessarily the possession of it. When the teacher looks upon successful instruction in this subject as the possession of knowledge solely, he is indifferent as to how that knowledge has been gained. Now the search after knowledge is slow and tedious; so it is much quicker and more satisfactory, from this teacher's point of view, to impart the knowledge rather than let his pupils search for it. Consequently he prefers just to tell his pupils things—so that, when asked, they may return the right answer. Such a method of instruction is of little value. On the other hand, though progress may be slower, and less ground may be covered, it is of the highest value that the children should be trained in habits of observation, of acquiring knowledge, and of drawing inferences from the knowledge gained.

School Gardens.

"It is gratifying to report that school gardens are beginning to be started in several schools. Rightly conducted, a school garden may be of great educational value, and a source of much pleasure; and it is to be hoped that before long school gardens will be the rule rather than, as at present, the exception in rural schools.

Drawing.

"In Drawing improvement is shown both in method and in the subjects taken for representation. When good methods of Nature Study prevail, the correlation of these two subjects is satisfactory. Brush Drawing is frequently done, but there is little Clay Modelling, though it has been introduced in a few cases."

Mr. Robb, per *Mr. Jamieson.*

Mr. Robb, Sub-Inspector, contributes the following note on Reading to H.M. Inspector Mr. Jamieson's report:—

Reading.

"During the past session there has been considerable improvement in the quality of Reading in the schools of the Edinburgh district. This improvement is noticeable:—

"(1) In more deliberate articulation and enunciation.

"(2) In more sensible and natural expression, based on more complete comprehension of the entire lesson. For this improvement the increased practice in oral composition is mainly responsible.

"(3) In the quality and quantity of the matter read at every stage. In almost every school the library is made an important adjunct to the Reading lessons. In many schools, supplementary readers are regularly used from the first, so that while one book is being studied with some care, another is being read at sight for pure enjoyment.

"There still remain one or two points in which improvement is very desirable. In Infant Classes word drill often too exclusively occupies the time of the children. They are too long in learning that a book has something to say to them. They frequently read words without any comprehension of the sense, even when the sense is quite interesting. This is in part due to the survival, in too many schools, of the practice of simultaneous Reading.

"As soon as the child is able to read a few words which convey a meaning, he ought to be led to perceive the sense—to express it orally or in drawing, to act it if possible—at any rate to recognise the all-important fact that the printed page and the spoken word and the picture and the action are closely linked.

"When a little child reads a sentence—not as a lesson, but for his own pleasure—he not infrequently, in the first instance, merely recognises and names the words; thereafter he reads it a second time with the intelligent phrasing which indicates complete comprehension. One still finds teachers who remain too long content with the lower process of the two, and by so doing retard the time when a child can find out for himself what a book has to say. Silent Reading might often be commenced at a much earlier stage than is customary.

School Libraries.

"Too often, in the establishment of school libraries, no provision is made for the little ones. But in one or two schools each class possesses its own select library."

To H.M. Inspector Mr. Jamieson's report, Mr. Crombie, Sub-Inspector, contributes the following remarks on Composition and Arithmetic :— *Mr. Crombie, per Mr. Jamieson.*

Composition.

"Within recent years there has been a concentration of attention on the teaching of English in the Primary School, and more particularly on that aspect of it which is concerned with the cultivation of the power of oral and written expression. Within the past two or three years there has been a more definite and conscious effort on the part of all concerned to render the school environment as effective and stimulative as possible for the successful development of this faculty. Methods have been keenly discussed and put to the test of experience; and the means and material that appear most suitable for the various stages of the pupil's progress have been carefully sifted and weighed. The activity in this direction has received a powerful impetus from the issue of the Department's recent Memorandum on the Teaching of English. There are most encouraging evidences of improvement in the teaching of this subject in all parts of the school. Systematic, as distinct from incidental, practice in oral Composition is now almost universally provided for in the infant and junior divisions of the school. A teacher of a class is now very rarely embarrassed when asked to detail the means employed to cultivate the pupil's powers of oral expression. The Reading lesson is utilised as formerly, but more systematically, the children being accustomed to narrate incidents which occur in it, or to give the gist of passages selected from it. Tales, legends, and historical incidents are widely employed. Narrations by the pupils are made a feature in the work of the higher infant classes; and many fresh and interesting devices are employed to foster this habit of speaking. The quality of the written attempts at expression by the younger classes in many schools is sometimes surprisingly good. Nature Knowledge lessons afford very suitable material for descriptive Composition exercises, and not a few teachers make a very effective use of such co-ordination of subjects.

"Many opportunities for practice in giving answers in a sequence of sentences occur at the recapitulatory stages of most lessons, but these are often neglected. In dealing with the pupils' narrations, opportunities occur for suggesting omitted details, better arrangement of matter, correction or improvement of form, etc. all of which could be obtained from the pupils themselves by skilful questioning; but these opportunities are too often not utilised to their full extent. The teacher should be ever on the outlook for variety and freshness of treatment so as to stimulate and preserve the interest of the pupils in this practice.

"It is probably too soon yet to expect considerable improvement in the written Composition exercises of the Senior Classes of the school. In a year or two, when pupils reach this stage after having passed through the whole systematised training from the Infant Division upwards, a distinct advance in the quality of this work may be confidently expected. Meanwhile, there is encouraging evidence that the leaven is spreading here also. Reproduction of a story, which for many years constituted the requirement of the Code in the case of the former fifth standard, is now, as a rule, very well done by pupils at a considerably earlier stage of their school course. The exercises done by the Qualifying Class also compare favourably with those done by pupils of the same age some years ago. There appears to be a growing power to use a more extensive vocabulary, ideas are more abundant, and free compositions seem to flow more easily. There may also be observed an increasing accuracy and completeness of expression, more particularly in descriptive exercises, and the use of the paragraph seems to be more widely practised.

Arithmetic.

"The experiences of the year point to very creditable progress in the teaching of Arithmetic. In most schools the earlier stages are very intelligently taught. Clearer conceptions prevail regarding the value of the

'concrete' in the initiatory steps. . . . The four elementary operations are generally taught concurrently.

"Through all the stages a skilful use of concrete examples forms the teacher's best weapon for awakening and building up knowledge of arithmetical processes in the mind of the pupil. But while this is so, there is another and not less important object to be gained. The pupil has also to be trained to become a ready and accurate calculator. There is a time very early in his training when he is able to visualise the numbers he has become familiar with in his handling of objects. Quite recently the members of an Infant Class towards the end of their first school year were tested individually with the object of discovering how many had reached this stage. The result showed that more than a half of the class had this visualising power and were able to do operations with numbers apart from the concrete examples. This section had reached a point in their arithmetical study when their powers of computation could be best quickened and strengthened by rapid practice with abstract numbers. The other section required continued concrete practice. The proper place and function of the concrete in these early stages require, therefore, to be carefully discriminated and noted by the teacher. Too slavish an adherence to the idea that every arithmetical operation done by young children must be through the concrete retards the acquisition of quickness in computation. In many Infant Departments where the two-fold aim of Arithmetic teaching is accurately gauged, the senior infants are adepts in rapid calculation with easy numbers in all the four elementary operations.

"Increasing attention is being paid to Mental Arithmetic, and there are encouraging evidences of progress in this respect.

"Knowledge of the conventional symbols of operation is now more common in the younger classes, and in many schools the pupils at all stages of advancement are being trained to set down on paper or blackboard the sequence of operations involved in the solution of problems. Here, however, there is room for improvement. Problems are still too often assigned to some particular 'rule' and worked to a definite pattern, important data in the given problem which do not fit the typical model being sometimes neglected with disastrous results.

"It is gratifying to note that the increased attention now given to the decimal notation is bearing good fruit in the more intelligent working of problems involving that system."

Mr. Michie: H.M. Inspector Mr. Michie reports on Spelling, Poetry, and Geography as follows:—

Spelling.

"An examination was conducted in a number of schools into the methods of instruction in Spelling and into the common types of mis-spellings. Good spelling, as one would expect, goes in the main with that power of attention which makes for success in all subjects, and it is consequently general in the good school or the good class.

"Occasionally the time devoted to the subject seems altogether excessive, and the methods of instruction are not such as to attain the desired end with the least expenditure of energy.

"In the Infant Classes where some phonic system of Reading is pursued, spelling and word-naming become one and the same process. The instruction is mainly oral, but after a time writing is employed, first in printed afterwards in script form. The number of irregular words in the reading book is at first limited. No difficulty is experienced in securing correct spelling of regular words. In the Junior division there is sometimes a breach in the continuity of the method of instruction and consequent educational loss. The pupil has now to adapt himself to a new method of Reading, and to attempt a reader in which many of the words are irregular, though short—for here brevity and ease are commonly, though mistakenly, interpreted as synonymous. If the pupils spell all words phonetically, it is

not surprising; nor is it surprising if the teacher in the Junior Division condemns the methods of the Infant Room as conducing to bad spelling.

"The weakness lies not merely in the non-conformity of methods, but in the failure to recognise the increasing importance of the visual memory, especially in dealing with irregular words. In this connection it is interesting to note the common errors in schools where Reading is not phonic—apart from such slips as reduplications and omissions which are obviously due to lack of care. Many, if not most, of the errors are due to phonetic spelling. Where some local idiosyncracy of pronunciation prevails, or where slovenliness of pronunciation is permitted, these defects are frequently reproduced in mis-spellings. The number of cases in which an emphatically sounded letter, such as , disturbs the sequence of letters is surprising. Again, the phenomenon is by no means uncommon of a class which spells correctly orally, but in writing spells indifferently. This is almost always traceable to excessive use of oral methods of instruction. The practice of indiscriminately learning by rote lists of spellings which are repeated *viva voce* will produce the ability to spell orally, but apart from writing this is an idle accomplishment.

"The necessity of making the pupil thoroughly familiar with the meaning as well as with the form of new words by employing them for several successive days; the value of extensive reading, of word-building, of derivation, and of rules for spelling—are well understood, and call for no comment.

"Much criticism has of late been directed to the poetry committed to memory in school. A distinct advance has to be recorded both in the quality and in the quantity of the poems professed. The selection is now more judiciously made, and frequently each child has memorised one or more voluntary pieces in addition to those learned collectively by the class. The selection of these voluntary poems may be made the occasion for an excellent lesson in the rudiments of literary criticism. Each pupil may choose, either from volumes of poetry in the school library, or from the poems which the teacher reads, re-reads, and discusses with the class, such as have the strongest personal appeal. While some have to be rejected by the teacher, it is surprising to find the excellent taste displayed by well-trained senior pupils. That the pupils evince an added interest in learning poems of their own selection, is only to be expected; but when one finds those who are far from content with the bare minimum, and who recite their pieces with marked taste and feeling, one may reasonably conclude that a genuine love of poetry has been instilled, and that the weary task of former years has been transformed into a highly pleasurable exercise. Poetry.

"The class is promoted, new poetry is accumulated. The recollection of the old poems fades till scarce a stanza can be repeated by any of the pupils, and the vision of a school anthology vanishes through the omission to transfer the record of work along with the class, and to devote a casual period to revision.

"The wealth of material comprised under the subject of Geography makes it imperative that rigorous selection should be exercised. This is a matter of considerable difficulty, but it seems a pity that so many teachers are content to place implicit trust in the judgment of the compiler of the elementary compendium which aims at including the largest number of facts in the smallest possible space. The emphasis laid on an acquaintance with, say, the names of mere villages in Ireland seems misplaced, and personal acquaintance with some of the hills in England which are commonly memorised, would probably prove a shock to the imagination of both teacher and child. There seems to be a call for the more judicious exercise of a sense of perspective in the selection of the material, as well as in the relative importance to be attached to the facts selected. Geography.

"While the study of Geography calls for the exercise of a considerable effort of memory, there is no reason why the memory should not be aided, as well as the subject naturalised, by the introduction of those connecting links which make for the permanence of the knowledge acquired. Physical,

Political, and Commercial Geography stand as isolated branches, mountains have no connection with rivers, nor have coalfields with the distribution of industries or population. The political division into countries is permitted to oust completely the natural geographical divisions. If more stress were laid on the causal inter-connections of the various sets of facts, the temptation to overload the memory with unimportant detail would be considerably reduced.

"In Supplementary and Senior Classes it is not uncommon to find each pupil provided with an atlas which is used in class while the teacher makes use of the wall-map. This is a laudable practice. It is singular, however, to find to what an extent the pupils are unable to interpret the conventional signs. Locating the positions of places is too frequently the almost exclusive use to which a map is put. Definite exercises in map-reading might with advantage be introduced. More or less fragmentary lessons in Home Geography generally precede the first employment of a map, but it is rare to find a school in which the study of the Home Geography receives the position its merits warrant."

Mr. Robb, per *Mr. Jamieson.* Music.

On Music, H.M. Inspector Mr. Jamieson gives the following remarks by Mr. Robb, Sub-Inspector :—

"Singing is taught in every school in the Edinburgh district, usually with a very fair measure of success.

"In several of the schools in the city, the voices of the pupils are admirably trained and all the teaching is most assiduous and earnest. In a good few country schools, on the other hand, much of the instruction is haphazard and unskilful.

"The best teachers of music usually regard their aim as a threefold one. Their work has a triple bearing on the pupil, who should respond (1) emotionally, (2) intellectually, (3) physically. The emotional response, under which the pupil is thrilled with the spirit which a song breathes, cannot be attained until due attention has been given to the intellectual aspect of the work. A child must understand what he sings, if he is to feel it. As far as possible, he must be made to feel the inevitableness of the music. His imagination must picture the situation of which the music is the expression. For these reasons the choice of songs cannot possibly be too careful. Therefore also the teacher must strive to stir in his pupil the intellectual concept most fitted to lead up to the emotional thrill inseparable from real music. One occasionally finds pupils reproducing with marvellous accuracy the tasteful models set by a teacher, while they remain grossly ignorant of the meaning of the words they sing. So far as the highest end in teaching is concerned, these pupils might as well be practising Italian vocables.

"Again, one finds pupils who can sing with taste and with obvious enjoyment and intelligence quite a number of prepared songs, but who display hesitation and dismay when confronted with the music of an unknown air, however simple. When this occurs, it is clear that the pupils are unlikely on leaving school to make excursions on their own account into the world of written composition. In far too many cases songs are really learnt by ear, though professedly from notes.

"In a few city schools single pupils, when asked to do so, stand and sing just as readily as they stand to read. This is as it ought to be. The reading of music is a comparatively easy process provided a child possesses some ear; but far too often, in his haste to hear a new song sung, the teacher instead of allowing the pupils to attempt to read the music—to blunder through it if need be—adopts the all too effective expedient of aiding their progress by vocal or instrumental examples. Frequent tests in home reading of music might be useful in this connection.

"Technique must not prevail over intelligence. A child ought, all through, to know just what he means, and what he wishes to achieve in music. No amount of practice in following the finest models of the most accomplished vocalist can atone for lack of intelligent comprehension.

"The purely physical aspect of the subject is not unimportant. The value of a song as a relief to tedium is not too well known. Care is not always taken to secure correct posture and the requisite atmospheric conditions for the singing lesson. Properly given, this lesson has large hygienic possibilities, and every effort should be made to combat the rather prevalent idea that the alpha and omega of the music teacher's work are comprised in the mere singing of songs."

Supplementary Courses.

In my last General Report I devoted a section of considerable length to a discussion of the progress made in Supplementary work and of the aims which teachers should keep before them in dealing with pupils at this stage. In each of the reports now before me careful attention is given to this part of the curriculum; and from what my colleagues say it is plain that, while the courses of study under Schedule V. are in most cases satisfactory, and in many cases excellent, there is far too little practical work done under Schedule VI. In large schools in towns there is usually provision made for Wood-work, Cookery, Laundry-work, Dress-making, or Practical Housekeeping. But often, in smaller schools, no one of these subjects is represented, nor is any other subject professed which can be regarded as an equivalent. In country schools it is clear that the Commercial Course is frequently adopted when the Rural Course would be more suitable. In small rural schools the main impediment to the institution of courses of practical instruction is found to be the initial cost of equipment. The cost need not be great; but in schools where there never can be more than a very few qualified pupils each year managers hesitate about even a very small outlay. My colleagues seem to be unanimously of opinion that this hesitation might in most cases be overcome by a small grant from the Department towards the cost of initial equipment.

Too little practical work.

With regard to the methods of instruction followed in these courses H.M. Inspectors feel that the mistake is often made of carrying into the Supplementary Course the purely didactic method, which may be appropriate in the Junior Division, but is out of place here. The opinion of my colleagues on the present state of Supplementary study will become clearer if I quote their remarks somewhat in detail. H.M. Inspector Mr. Smith writes:—

Too much teaching; too little individual study.

Mr. Smith.

"The first thing to remark about Supplementary Courses in Fifeshire is that there are still too few of them. Last session there were only 94 Supplementary Courses to 146 schools. The deficiency is not indeed so great as these figures would indicate. For of the fifty-two schools that have no Supplementary Course, seventeen may be described as Infant or Junior Schools, five have Higher Grade Departments, and two are Elementary Departments of Secondary Schools. There are also a few cases, not falling under these heads, in which it is more convenient to send the children to a neighbouring Supplementary Course than to institute a new one. But there are still some two dozen schools—mostly in rural districts—that ought to have Supplementary Courses of their own, and have not. In general, I should say that every school that is not within easy range of an existing Supplementary Course, ought to have one of its own. *Per contra* it might be argued that in the larger towns the number of Supplementary Courses

might be reduced, and a measure of centralisation attempted with gain both in economy and in efficiency. And something has been done in that way, both in Kirkcaldy and in Cowdenbeath; and I hope to have further progress to report when the Dysart and Wemyss School Boards have completed their new schools. Something has also been done to make good the deficiency in the rural parts of the district; new Supplementary Courses have been started at Carnock, Kemback, Carnbee, Craigrothie, and Kilmany. The worst offenders in this respect are the School Boards of Springfield, Cameron, Monimail, and Kirkcaldy Landward, which possess not a single Supplementary Course to their names. The assistance now given to small schools by the General Aid Grant leaves little excuse for inaction on the score of staff. Equipment, no doubt, is another thing.

"The next point that engaged our attention was the extent to which the Supplementary Courses were really catering for the wants of their pupils. There the results were not entirely satisfactory. To begin with, almost all the Supplementary Courses—even in the larger towns—were mixed. Now, whatever arguments may be urged in favour of classification by sex are most powerful at this stage. There is in fact nothing—not even Arithmetic—common to boys and girls in the Sixth Schedule. For purposes of organisation, separation of the sexes (where it can be managed) is the simplest and most effective plan. And it has other fairly obvious advantages, into which I need not go. In the second place, the Commercial Course was unduly popular, even in purely industrial centres. I have called out a large 'Commercial' class of boys and asked them individually what they were going to do; not one in ten had any intention of engaging in Commerce. The number of Commercial Supplementary Courses really needed in Fife might be counted on the fingers of one hand. One feels the absurdity pretty strongly in the case of girls—of girls who will presently enter a factory, and emerge from it at twenty-one to keep house by the light of nature, spending their last months at school on Stocks, and True Discount, and Book-keeping by Double Entry. But on the whole there is not much of this. There is a fair provision for the teaching of Cookery and Laundry work, even in several of the rural schools. This is due to our strong and sagacious County Committee. The Committee employs a number of expert teachers of Cookery and Laundry work, whom they lend to the School Boards. The needful apparatus is provided at a reduced figure, and part of the teacher's salary is also made up by the Committee. One of these teachers is stationed at a centre from which she visits five (sometimes even seven) schools a week, generally the whole year round. The boys do not yet fare so well. I have been urgent with the Committee to do something of the same sort for them, and there is now no lack of qualified instruction; but the expense of erecting workshops has so far barred our progress. But not altogether. I am able to report at least the promise of workshops in Leven, in Wemyss, in Dysart, and in Lochgelly. And even where there is no workshop or promise of one, a start has been made with that Practical Geometry and Mensuration of which the Workshop Practice is, after all, an appendage. Nor is Woodwork the only form of Practical Instruction that is in place in boys' Supplementary Courses. In some of the schools Experimental Science takes its place—a perfectly legitimate development, *e.g.*, in mining districts. And I can conceive of other developments that would be equally legitimate, *e.g.*, in towns devoted to textile industries. In the rural schools, on the other hand, we should seek to develop the Rural Course. There, too, the County Committee helps with a subsidy for the formation of school gardens. As yet there are far too few of these—at this moment I can recall no more than five. But there is no reason to despond. Many of my country teachers are excellent botanists and good practical gardeners; and sometimes, where there is no school garden, the boys are taken into the master's garden. As an example of what can be done in a school of no great size, I may mention Forgan Public School, a school with 100 on roll, where the boys get Practical Gardening from the head master, and the girls get Practical Household Management

(including Cookery) from his wife in the schoolhouse. It is along these lines that the problem of Practical Instruction can be solved in rural schools. My real apprehension is that the supply of male teachers fit to teach rural schools may fail.

"So far of the Sixth Schedule. When I turn to the subjects of Schedule V. I am able to speak with much greater satisfaction. The teachers, almost without exception, are keen, and the pupils genuinely interested in their work. In several—one might almost say in many—of the Supplementary Courses the results are as good as any reasonable man could desire. The oral work is sometimes brilliant. At some of the mining schools—a class of school of which I had practically no previous knowledge—I was greatly struck with the robust intelligence and manly style of the boys. The only real defect on this side of the work is the failure to develop independent effort on the part of the pupils. The teachers almost all teach too much as if they were preparing their pupils for an examination; they make too much of smartness in oral answering and thorough mastery of all the work by all the pupils. They do too much for the pupils, in fact, and do not yet sufficiently recognise that one main purpose of these courses is to teach the children how to learn for themselves. The books of reference are sometimes, I fear, more for ornament than use. The treatment of History and Geography is too narrow and (heretical as it sounds to say so) too systematic. In our Supplementary Courses I am fairly clear that we should attempt to extend the horizon of the pupils beyond the ordinary bounds of British History; and also that both in History and in Geography the methods should be less categorical and more 'heuristic' than in younger classes. But, with this no doubt considerable deduction, it is possible to reflect with real satisfaction on the treatment of subjects of general education in most of the Fife Supplementary Courses."

H.M. Inspector Mr. Millar reports :— *Mr. Millar.*

"The great merit of the course of instruction outlined in Schedule V. of the Code is that it has emphasised the importance of the pupil taking a more active share than formerly in his own education. It seems odd that such a truism as that mental, like physical, development depends on active exercise should need to be emphasised; but that a bad examination system can induce the adoption of methods that do not promote a high degree of mental development is only too obvious. In education the main principles are few, simple, and obvious, but to have them even tolerably carried out in practice would tax the best powers of a Napoleon turned educational administrator. Schedule V.

"The full development of the Industrial, Household Management, and Rural Courses involves a large expenditure, and progress is consequently slow. The time usually given in Manual Instruction in connection with these courses would have to be considerably increased in order to extract from them the utmost benefit. It is satisfactory to report, however, that Woodwork continues to make headway. Falkirk Burgh School Board have just added it to the curriculum of their classes, and Falkirk Landward School Board are making improved arrangements for the teaching of Woodwork and Household Management. With respect to the rural Courses there is not as yet much progress to report. Buchanan Public School, which was already specially well equipped for the teaching of Nature Study and Geography, has added a school garden to its equipment; but the initial expenditure necessary is a stumbling-block to most country boards. At the present time, when the splendid openings to be found in the Colonies offer encouragement to country dwellers to resist the attractions of the town, it is more than ever desirable that the potentialities of the Rural Course should be more fully developed. A workshop, a school garden, and a cookery-room should form part of the equipment of most country schools; and an incidental advantage of this would be that the cookery-room, with the facilities it would afford for the provision of a hot cooked meal in the Schedule VI.

middle of the day, would also minister greatly to the health and comfort of the pupils, and would conduce to greater regularity of attendance."

Mr. Clark. H.M. Inspector Mr. Clark reports :—

"Outside Perth City, where there are two Supplementary Class centres—one at Caledonian Road Public School for all the Qualified Pupils in the public schools, the other at St. John's Roman Catholic School—there were eighty-two schools with Supplementary Courses. To five of these schools no grant was paid. Grants were paid to the rest for the average attendance of 570 pupils, of whom 175 were in Perth City. Thus the grant was paid for 395 pupils in eighty-two schools, or, on an average, for 4·8 pupils in each of them. It may be of interest to note that, of the seventy-nine schools for which the grant was paid under Article 21, fifty-six had an average attendance in Supplementary Courses of six pupils or fewer (seven had one, eight had two, eighteen had three, ten had four, nine had five, four had six); eighteen, between six and twenty pupils; three, between twenty and thirty; one had forty; and one had 173.

English. "With regard to the instruction it may be said generally that satisfactory progress has been made in the development of the courses in English. The works of good authors are being studied more extensively both in school and at home, and there can be no doubt that, when the habit of reading continuous works is created at an earlier stage in the curriculum, a still further advance will be possible in the reading of many of the Supplementary Classes. In some of the best courses in both town and country a surprising amount of valuable work has been done in English, and the following records of work may serve as examples of what can be achieved by good pupils when carefully guided and stimulated. Both records cover a period of six months, and are written by a boy and girl who were taught in different classes in Caledonian Road Public School, Perth. The boy's record shows, under the section of 'School Studies,' the progress of his class in their study of *The Fair Maid of Perth* and *Julius Cæsar*, the repetition of extracts from that play, of some of the finer passages from *Henry VIII.*, of several short poems, and of passages from Addison and Ruskin. The record further contains entries of the information acquired by consulting reference books, and of the reading done at home. The home-reading includes nineteen books, most of which are works of standard merit; *e.g.*, novels of Scott and of Dickens, *The Vicar of Wakefield*, the *Boy's Iliad*, etc. The teacher's marks, given after testing the home reading, bear out the fact that the boy had read with intelligence and appreciation.

"The girl's record of work contains, under the head of 'School Studies,' stories from the *Canterbury Tales*, the *Cricket on the Hearth*, *Don Quixote*, *Evangeline*, *Kidnapped*, and *Julius Cæsar*. Her home reading is *Oliver Twist*, *Kenilworth*, *Adam Bede*, *Cranford*, *The Mill on the Floss*, *Hypatia*, *The Ebb-tide*, *A Nest of Linnets*.

"The record further shows that a large number of excellent passages had been committed to memory, that summaries had been made of stories read, and that Composition had been carefully correlated with topics treated in school and had been practised extensively.

"While these are records of two of the best pupils, the records of the other pupils testified that a very fair amount of work had been done on the same sound and stimulative lines. The home-reading overtaken by these two pupils may be somewhat ambitious for the average pupil, and some of it might wisely, perhaps, have been postponed even in the case of these two; but at all events, if the teaching in a Supplementary Course gives such pupils the taste for reading, the power of appreciating what they read, and such a knowledge of good literature as will help them to discriminate in selecting books from a public library after they leave school, the pupils will have derived from it a valuable part of their education.

"In the larger schools the topics of Schedule V. (*b*) are, as a rule, well treated; but in some of the smaller schools the instruction is often insufficiently differentiated from ordinary Senior Division work. Schedule V. (*b*).

"The least satisfactory part of the Supplementary Class work is still the practical side. In a rural district like Perthshire progress in the provision for Practical Instruction is necessarily slow. In the case of the smaller schools, which are in the majority, the expenditure required for providing a room, material, and a teacher is too great for rural boards in small parishes to incur; and such provision as is necessary to make a Supplementary Course complete can only be made if boards receive additional aid to enable them to secure the services of a visiting teacher for several schools within a given area. Too little practical work.

"Outside Perth city, Cookery is taught in eleven schools—an increase of five since last year; Woodwork in three, an increase of one. Workshops are now provided, however, at Crieff Public School and Blairgowrie Higher Grade School.

"All the courses of Schedule VI. suitable for a town school continue to be admirably conducted in Caledonian Road Public School, Perth.

"In the country schools the majority of the courses are a combination of Commercial and Rural, with the inclusion of Practical Geometry and Mensuration. In a few of them practical land-measuring is carried out.

"The genuine Rural Course is carried out in a practical form only in one or two cases where the teachers are enthusiasts in gardening or in the keeping of bees. This is to be regretted, as there can be no doubt of the value of School Gardening from an educative as well as a utilitarian point of view. School Gardening is the natural complement of Nature Study in a curriculum designed to bring the country child who is to leave school at fourteen into touch with his surroundings; and, apart altogether from the beneficial results of such manual work to the pupils, or the effects that such occupation in our schools might ultimately have on rural prosperity, practical instruction in gardening ought to be encouraged by Boards. Little progress, however, will be made until the teachers have the right attitude of mind to Nature Study. No doubt a good deal could be done to create this attitude by Summer Courses of Horticulture designed to prepare teachers to take up the work in the right spirit. In the meantime few teachers know the application of science to horticulture, and instruction in gardening without a knowledge of the underlying principles is valueless, The pupil must know the 'why' if he is to be able to deal intelligently with any new set of conditions he may have to face." Rural Course.

H.M. Inspector Mr. Fleming reports:— *Mr. Fleming.*

"Of Supplementary Courses it is regrettable to have to report that little or no progress is being made; in fact, through the dropping out of some Rural Courses, there are actually fewer recognised Supplementary Courses this year than last. So far it may be said that Supplementary Courses in rural schools have not been a success in this district. The reasons are twofold; first, the managers are to blame, and, secondly, the teachers. On the other hand it has to be remembered that the paucity of Supplementary Courses is accounted for by the failure to obtain recognition owing to inability to comply with the requirements. The points of defect are, in some cases, inadequacy of staff, and, more generally, the failure to give satisfactory instruction under Schedule VI. The subjects of Schedule V. are well taught as a rule, both in recognised Supplementary Courses and in schools which have no recognised Supplementary Course; and many of the latter are doing excellent work. Too few Courses.

"To gain recognition of a Supplementary Course and earn Grant under Article 21, it would frequently be necessary to increase the staff, and thereby some structural alteration would be required. Few School Boards are prepared to meet the expense, and in the case of small Supplementary Courses the extra money earned under Acticle 21 is not enough to induce them to

move, nor are they willing as a rule to provide the equipment and accommodation necessary for subjects of Practical Instruction.

"Even if School Boards were willing to incur the expense connected with making provision for Supplementary Courses, there would still be a difficulty in getting teachers.

Misconception of aims.

"There still is, among teachers generally, widespread misconception of the aims of a Supplementary Course. Teachers seem unable to disabuse themselves of the idea that their duty with regard to children beyond the stage of the Qualifying Examination is to press on with instruction on the same lines as before. Associations of the work of the Ex-VI. Standard and Specific Subjects still dominate their minds; and they grudge to give time to what may be called some of the newer subjects, to the detriment of the children's progress in the old. They do not realise that the instruction of children in the last period of their school days, when once they have attained the stage of the Qualifying Examination, should be directed mainly to the fitting them for practical life, and that it is their duty to find out what further education will best suit the circumstances and conditions in which their children will be placed. It is reassuring to know that the public—or at any rate part of the public—is beginning to express dissatisfaction with the present system of education, and to demand that children should be in some measure prepared for their work in life. In country districts the agricultural interest loudly complains of the unsuitability of school education, and quite recently the Scottish Chamber of Agriculture severely criticised Supplementary Courses in that they did nothing to equip the rural child for agricultural pursuits.

Lack of qualified teachers for Schedule VI. work.

"While there does undoubtedly exist among teachers a misconception of what a Supplementary Course should be, and not infrequently, too, a want of sympathy with these aims, it is unfortunate that it is not easy to find a teacher thoroughly qualified to undertake this work. The fault is not in the man himself altogether, for the training which he has received has not been directed towards preparing him for rural work. It is unfortunate that so many teachers are town bred and town reared; all are town trained, and their professional experience has been confined—not infrequently—to town schools before they come to the country. It is gratifying, however, to report that many take up their work in the country with much enthusiasm, and that many take every opportunity and much trouble to make themselves qualified in such subjects as they need. At present, then, it is not easy to get teachers qualified to give instruction in practical subjects, and the possibilities of the School Garden, especially in its relation to agriculture, are as yet dimly perceived.

Practical subjects.

"With regard to some subjects of practical instruction it would not only be feasible, but also a very satisfactory arrangement, for several contiguous boards to combine to engage the services of a qualified teacher. At present no such combination has been formed, though I am hopeful something of the sort may be done.

"At present several schools have School Gardens, and several teachers are attending a class under Article 55 in this subject. In Ednam, Broughton, and West Linton Woodwork is taught to boys. But Ednam and Ancrum are the only two rural schools that give any practical instruction to girls. Ednam School has a very full and interesting Course: Wood-carving and Woodwork, Cookery, Laundry Work, Dressmaking, and Dairying for both boys and girls are taught. The work done is highly satisfactory, and the Dairying class has aroused great interest and met with much success. Of the larger centres, only Peebles, Kelso, and Duns provide both Manual Instruction for boys and Cookery and Laundry Work for girls. In Eyemouth, instruction in Laundry Work and Cookery has been commenced. Cookery is here taught to boys. They are the sons of fishermen, and the great majority will probably become fishermen, so that instruction of this kind will be of practical value to them. The boys have taken to the work with great zest, and have made a capital start. On the other hand, in Hawick, no practical

instruction recognised for grant is at present given, though this defect is to be remedied. In Galashiels, Cookery only is taught. In Selkirk, the school board refused to do anything. However, the governors of the Scott and Oliver Trust have now undertaken at the Selkirk High School the duties of the school board with regard to the Supplementary Courses. The qualified pupils are all drafted to the High School, where they receive instruction in Cookery, and a new building has been put up for the instruction in Woodwork."

H.M. Inspector Mr. Fraser reports :— *Mr. Fraser.*

Work under Schedule V.

"Under Schedule V.B. of the Code are mentioned six studies that may appropriately be taken up in a Supplementary Course, but it is not imperative that all be taken up. This point it is necessary to emphasise; for there is a decided tendency to overload the Supplementary Course curriculum by the inclusion of too many subjects. Neither is the list in the Code meant to be exhaustive, and, as a matter of fact, it is practically universal to include History and Geography as essential parts of a Supplementary Course. To this no objection need be made; indeed, as these subjects form an important part of the previous curriculum as laid down in Article 19A, to ignore them after the qualifying stage could scarcely be wise. In some Supplementary Courses, then, we have eight items all attempted under Schedule V.B, and taught as 'Class Subjects.' Such cases are not common, but it is too common to attempt too much in this way; and where this is done, it is but rarely that these studies are taken up in the spirit of Circular 374.

Often too much attempted.

And with erroneous aims.

"Where, as in the case of the 'Laws of Health,' Conditions of Trade and Employment, etc. the subject-matter is quite new to most of the pupils; and where the main object is to impart certain facts in themselves of importance to every human being, the teaching may advantageously be of the nature of 'class teaching,' the more so as the underlying principles cannot readily be grasped by the children. Such teaching, in the words of the Circular, must be 'mainly empirical.' But with subjects such as History and Geography (including (4) and (5) of the Schedule), the case is different. The main outlines of these have already been studied, and no doubt largely forgotten; a revision course, such as is commonly given may serve to fix a few more facts more or less permanently in the scholars' minds, but it serves no very valuable purpose when the child, at the age of fourteen, is deprived of further tuition. For, after all, it is not of much importance to most people to be quite clear as to the course of the Danube or the succession of events in the Civil War, though the mental effort put forth in learning such things and setting them in their proper relation to other similar things is doubtless of great value. But circumstances may, and do, arise when it is desirable to be able to acquire pieces of information of this nature, and the aim of Supplementary Course study should be, without sacrificing the mental effort involved, so to equip the children that they can in future life find these things out for themselves, whether for a definite practical end or because something has aroused their interest in the matter. Indeed, this aim need not be confined to the Supplementary Course, but there it is paramount.

Use of works of reference.

"Now in these days of Public Reference Libraries it is easy to get at most kinds of information, provided one knows where and how to look for it, and the best way to teach this is to practise the children in the use of works of reference. For this purpose the reference library of the school should be well stocked, and should be kept, not in the hall or in the headmaster's room, but on a shelf in the Supplementary Course room where any pupil may use it without let or hindrance; and a good allowance should be made in the time-table for time spent in acquiring, in this way, information on some subject which will subsequently form the theme of an essay. Nor need the pupil be confined to the school library; if the nature of the theme permit, material may be amassed at home, or by direct observation.

"An objection frequently urged to such a scheme is that there are not enough reference works to go round the class. No doubt, so long as the

whole class is kept at one thing, this is true; but there is no reason why all should be doing the same work at the same time. Indeed, the grouping of pupils in this manner is implied in the concluding paragraph of Schedule V.B."

Mr. Michie.

H.M. Inspector Mr. Michie reports :—

Courses often not adapted to the needs of the pupils.

"The chief industry in a considerable part of this district is Mining. In the schools of this region the problem of devising a course of instruction having a direct bearing on the requirements of the pupils' after-school life seems unusually well-defined. The courses at present pursued are mainly 'Commercial.' When one finds the future miner engaged in learning Shorthand and Book-keeping, it is difficult to avoid the conclusion that the Managers have not yet devoted serious attention to the possibilities of Supplementary Course instruction. A general scheme of work suitable for such schools is outlined below. It should, however, be regarded only as suggestive. It is drafted in the hope that Managers may bring their expert knowledge to bear in formulating a scheme which meets the requirements of their district.

Mining Course.

Suggestion for Mining Course.

(i.) *Drawing and Mathematics* :—

(*a*) Construction and use of scales, including those commonly used for maps and mine-plans. The chief properties of the triangle and circle, arrived at experimentally by construction and measurement. Mensuration of lengths, surfaces and volumes by measurements actually made by the pupils. Freehand dimensioned sketches of objects. Construction of plans, elevations and sections from these sketches.

(*b*) Applications of Arithmetic previously acquired to questions in Mining. Extraction of roots. Algebra treated as generalised Arithmetic. Simple Equations applied to problems in Mining.

(ii.) *Surveying and Map-reading* :—

The use of simple surveying instruments in mapping in the field. Chain, compass, level, and theodolite. Reading of mine-plans and sections. Reading of ordnance and geological survey maps of the district. Construction of sections from maps.

(iii.) *Elements of Physics and Chemistry* :—

Simple experiments on Specific Gravity, Hydrostatics, and Heat. Simple Chemistry of the Mine-gases.

"In order to carry out such a scheme effectively, a simple laboratory is desirable; in small schools a combined cookery-room and laboratory could be equipped at no great expense.

"The adoption of some such course would not only prove of more lasting benefit, but should place the pupils in a better position to follow with profit the work of the Continuation School, and consequently induce a large proportion to continue their education. It is at the initial stages of the Continuation Classes that so many become disheartened through discovering that their previous training is inadequate. The abler pupils, after some such training, should be able to proceed at once into a second year course in Mining. This, again, might operate in the direction of inducing them to join the Continuation Classes immediately after completing their day-school education."

Higher Grade Schools (or Departments).

Demand for Higher Grade Schools growing.

The demand for instruction in the curriculum suggested in Chapter IX. of the Code continues to grow. Some new Higher Grade departments have been opened in the Division during the year; other new Departments are in process of organization; and other Departments already existing have improved their organization and curricula. In practically all schools of this class the

"Uniform Course" is now followed; but the schools differ widely from one another. Some are, in respect of staff and curriculum, Secondary Schools, able to carry their scholars much beyond a three years' course. Where there is no already existing and efficient Secondary School easily accessible to the scholars, the full secondary curriculum is desirable. This must sometimes be the case in country districts—for the present at least; and where the Higher Grade School has been chosen as a centre for Junior Students, a curriculum of at least five years, with adequate staff, is one of the requirements. In localities where the provision for secondary education is already ample, the undue development of Higher Grade curricula is to be deprecated. The wiser policy would seem to be to strengthen the Secondary Schools, and to make them available to all pupils who desire a school education beyond that of which the Intermediate Certificate is evidence. It would be interesting to know how far the increasing numbers that attend Higher Grade Schools consist of pupils who, but for the existence of such schools, would have gone to the older Secondary Schools, and how far they are pupils who would have ceased to attend any school at a much earlier age if the Higher Grade Schools had not been available. The indications are that the great majority of Higher Grade pupils belong to the latter class. A new taste and a new demand seem to have arisen, and within quite a few years parents seem to have become much more ready at least to acquiesce in the prolongation of school life. Curricula.

In some cases confusion still exists between the aims of Supplementary instruction and of Higher Grade instruction, and pupils are found in Higher Grade Departments who would be much more suitably trained in Supplementary Courses. But this evil is rapidly abating, and a very fair percentage of Higher Grade scholars now complete the course for the Intermediate Certificate. Confusion between Supplementary Courses and Higher Grade Schools.

School Libraries.

The institution of Supplementary Courses has forced into prominence the necessity for school libraries. Without the aid of a small library study in a Supplementary class cannot proceed as Your Lordships intended that it should proceed; and in the majority of cases my colleagues have rightly refused to recognize courses unless at least the nucleus of a reference library was provided. This policy has secured the introduction of libraries into a very large number of schools which would otherwise have continued to do without. This is a form of equipment in which the majority of Scottish Elementary Schools have hitherto been deficient, and the utility of the library is by no means confined to the Supplementary Course. The effect of the instruction in all the elementary classes will be greatly increased if the children begin to read for themselves, and learn at an early age to take an interest in books which are not lesson-books. I shall here quote the remarks made by H.M. Inspectors Mr. Smith and Mr. Millar on this subject. Mr. Smith says:— Supplementary Courses and School Libraries.

Mr. Smith. "The returns made on Forms 9 and 9b showed that at the ends of their various financial years, seventy-nine schools in the district possessed *School Libraries.* By this time the number has been considerably increased. But the provision is still inadequate. Every school should have a library. The existence of a village library is sometimes made an excuse for inaction. The excuse is insufficient. The ordinary village library does not, except by accident, possess a proper supply of books suitable for young readers; even if it did, the teacher has not the same opportunity for guiding and supervising the reading. Home reading should not be confined to the Supplementary Course. The children should have some form of continuous reading as soon as they have learned to read with pleasure to themselves.

"Such libraries as exist have been got together in various ways—by private donations, by the proceeds of concerts, etc. Many of them, and those the most useful, have been given by Mr. Coats, of Paisley. Mr. Coats has been very generous to Fife: I trust we have not yet exhausted his generosity."

And Mr. Millar reports:—

Mr. Millar. "While the whole aim of the teaching in a well-conducted school will be to keep the pupil's mind active, the most direct instrument of self-education will be found in the school library. We have, perhaps, been rather slow to realise this; in France, for instance (Board of Education, Special Reports, Vol. VII., p. 199), school libraries were established in every primary school by a decree of June 1st, 1862. At any rate, it is satisfactory to report that practically every school is now either provided with a library of its own or has made special arrangements for using a public library. So far as the country schools are concerned such a state of matters would have been impossible but for the generous assistance of Mr. James Coats, whose unostentatious benefactions deserve the warm gratitude of all who are interested in education and will, I believe, exercise a powerful influence for good on the life of the coming generation. The town schools are, as a rule, well equipped in this respect. Allan's School, Stirling, has been mentioned in a previous report as having done pioneer work in the use of class-libraries. In Carmuirs School, Falkirk, every class above the Infant Department is provided with a library of at least seventy volumes, and these are actively circulated and widely read. There have been in the past session some notable instances of self-help in regard to the provision or improvement of libraries, which speak well for the enthusiasm of the teachers. Denny Public School raised and expended no less a sum than £160, partly on the improvement of its library, and partly on adorning the school with admirably chosen reproductions of good pictures. Falkirk Camelon Public School celebrated the opening of its excellent new premises by raising close on £100 for a school library; while Falkirk Victoria Public School raised a similar sum for the improvement of its equipment—already good—in regard to teachers', school, and class libraries."

Physical Training.

Rapid improvement.

The progress made in this matter during the past three years has, over all, been more rapid than that made in any other subject of the school curriculum. School managers and teachers are awakening to a sense of the importance of the subject; and the supply of teachers capable of giving skilful instruction is steadily increasing. The members of the inspection staff have been in constant communication with Captain Foster, Inspector of Physical Training, and they seem to understand his ideas and aims. The School Board of Edinburgh, acting in conjunction with the Edinburgh Provincial Committee, have made an important new departure in appointing an officer to supervise the instruction in physical

Good arrangement made in Edinburgh.

exercises given in the schools under the Board; and Captain Cheales, whose services they have been fortunate in securing, is to act as organizer to the Provincial Committee as well. The localities in which the increased attention to Physical Training in schools appears to have been most noticeable are Edinburgh, Leith, and the western district of Fifeshire.

On this important subject, at present one of so much general interest, I have pleasure in appending to this Report a *précis*— with more special reference to the Southern Division—of the valuable report for the past session by Captain Foster on *The Physical Training in Scottish Primary Schools.* Appendix I.—*Captain Foster's* Report.

And in this connexion I give the following quotations from H.M. Inspector Mr. Fleming's Report, because of the graphic and telling way in which it calls attention to a question which, for the sake of the mental no less than of the physical health of the young children in our small country schools, urgently calls for far more serious consideration than it has yet received—What is to be done at the rural school for the real well-being of the *infants?*

"Three large classes under Article 55 of the Regulations for the Training of Teachers were held last year in Duns, Hawick, and Galashiels. These classes have done a great deal of good: but until the teachers themselves are competent to instruct under the guidance and with the advice of an expert, Physical Training will not be thoroughly satisfactory.

"The physical development of the children suffers in the meantime from the bad type of desk provided, from the ventilation and heating of the schools not being satisfactory in many instances, from the lack of proper physical exercises, and more than all from the lack of play.

"On this latter point it is hardly possible to describe too strongly the iniquity of making small and young children pass many hours of the day in a classroom where any restlessness on their part due to the suppression of natural activity is promptly rebuked and not infrequently punished. For them there is no recreation, no physical relaxation. Let me describe what happens in many a country school on a cold winter's day. After a walk often taking an hour, the child of seven years old reaches the school at 9.30 or thereabout. He enters a cold school in which the fire or stove has only been lit for perhaps an hour, more likely less: all the windows are shut to keep out the cold. He sits down in his place; quite likely there is no support for his back, or such a support that his sitting position is a harmful one. He begins to scrawl on his slate or finger his book; this, in a 'one-teacher' school will too often be his occupation during the whole school time, except for the period when he is brought to the floor perhaps for twenty minutes in the day to 'say his lesson.' After some two hours of this there is perhaps a five minutes' run in the playground, and about 12.30 there is an interval during which the teacher takes his dinner. The child can then run about the playground as soon as he has eaten his 'piece'; but if the weather is wet, he has a cold shed to go to, or back into the school—probably the latter, if it is not locked. The two hours of the afternoon pass as the morning; he has to keep quiet, that is the main thing. Once a week he is got out of his place and stood on the floor for half an hour while physical exercises are done. He wags his arms or moves his feet in imitation of his neighbours, and quite likes it. Then to the desk once more till he goes home. In many bigger schools, too, much the same goes on. I once asked an infant mistress what games they played. I was told they played no games there; and the tone of voice in which the reply was made and the expression which accompanied it could not have been more rebuking if I had asked her if she taught her children to pick pockets.

'Thanks to the teachers' classes in Physical Training some games are beginning to be played. Occasionally one finds the boys have a football which they kick about. In Hawick, athletic sports for school children are held, and in Hawick and Galashiels school football is organised and played. But generally speaking there is little or nothing of organised school play as there should be. Play should be regarded as an essential occupation of the school time, and as an essential part of the curriculum of Physical Training."

Household Management.

Under the stimulus of Miss Crawford's very zealous and effective work as Inspectress of Cookery, Laundry Work, etc. for Scotland a great advance has been made in the teaching of Household Management subjects in the schools of the Division. The progress to be recorded there might have been still more marked if Miss Crawford had had a less onerous task to perform. But, with the supervision of the instruction in domestic subjects in all the four divisions, it has been impossible for her to visit each school or centre with such frequency as could be desired.

Appendix II.—*Miss Crawford's* Report.

As a Second Appendix to this Report I give Miss Crawford's report upon the work that she has seen in the Southern Division.

In conclusion, I desire to express my indebtedness to all my colleagues in the Southern Division for their able, full, and informing contributions towards this General Report; and specially to thank my more immediate coadjutor and district colleague, Mr. Jamieson, for the very willing and valuable help he has given me in the preparation of it.

I have the honour to be,
My Lords,
Your Lordships' obedient Servant,
A. E. Scougal.

To the Right Honourable
The Lords of the Committee of Council
on Education in Scotland.

APPENDIX I.

Report on the Physical Training in Scottish Primary Schools.

(Captain Foster.)

Progress.

During the past year considerable progress has been made in a number of Primary Schools towards a better system of physical training. Most of the School Boards with which I have come in touch have made arrangements for their Primary School teachers to take a more active part in the physical training of their pupils. Several Boards have also engaged the services of fully trained instructors to act as visiting teachers to their Primary Schools, and gradually to train the staffs in the new system. Numerous teachers' classes for physical training have been held in all parts of the country, and have been well attended. Some of these classes have been for Infant Department teachers for whom a special course was arranged.

There has been a considerable improvement in the bearing and alertness of the pupils, and a commencement has been made in working out a scheme of physical training to cover the whole of the Primary School course, and to secure for every class Exercises suitable for the average mental and physical powers of the pupils.

In those schools where the teachers take an active part in the physical training of their own classes the results are most pleasing.

The ordinary teachers and this work.

After the experience of the last three years, I am more than ever convinced that the only workable plan for the carrying out of physical training in Primary Schools is for the teachers to take their own classes, provided they are afforded expert advice and help. Where the teachers carry out the physical training, it has been found possible to arrange several periods of exercise during the week for the various classes, besides the short periods given between lessons to refresh the pupils. The lessons for the younger classes have also in many cases been shortened, especially in Infant Departments.

In the next few years many of the difficulties which at present exist should disappear.

Students under Provincial Committees.

The students under the Provincial Committees are gradually being placed under highly trained instructors, and at some centres more time is devoted to the subject. When the students come to teach in the Primary Schools, they should be really efficient instructors.

Junior Students.

Several School Boards, who have secured the services of suitable qualified Instructors, are arranging a course of physical training for their Junior Students in connection with the course they will receive as Students in Full Training. These Junior Students will also receive some very Elementary Instruction in Anatomy, Physiology, and personal Hygiene, to enable them to understand the principles of the system.

Edinburgh.

The School Board of Edinburgh has in conjunction with the Edinburgh Provincial Committee appointed a male Physical Training Superintendent to organise and supervise the whole of the physical training arrangements in the schools under the Board, including the physical training of Junior Students. He will also supervise the physical training of students under the Provincial Committee. This arrangement should be a great help when arranging the course of physical training for the students under the Provincial Committee, and should ensure that the requirements of the class-

teachers are always kept in view. It should also make it easier to arrange for the students under the Provincial Committee to have plenty of practice in teaching classes of school children.

County Committees. Some of the County Committees have been considering the questions of engaging the services of fully qualified Physical Training Instructors and allowing country School Boards to engage part of their services to supervise the physical training in their schools and gradually to train the class-teachers. This should give a great impetus to the interest in physical training in country districts.

Appointments of specially trained instructors at Edinburgh; The following specially trained Instructors have been appointed by various School Boards:—

The Edinburgh Board have appointed Captain Cheales to supervise the whole of the physical training in their schools. They have also appointed Miss Dudgeon, from the Dartford Physical Training College, to carry out the physical training of the girls in their two Higher Grade Schools, and of the female pupil-teachers. They are also considering the question of appointing a specially trained Lady Instructor to act as visiting teacher in the Infant Departments of the Primary Schools under the Board.

at Stirling. The Stirling School Board have appointed a Lady Instructor from the Dunfermline Physical Training College.

Records of physical measurement. Medical inspection. With the increased interest in the physical training of school children the questions of records of physical measurement and medical inspection are receiving more attention. At Dunfermline the Carnegie Trustees are continuing the very thorough medical inspection of school children. The system of records of measurements has been modified so as to follow the lines advised by the Anthropometric Committee. The Medical Staff who carry out the work has lately attended a course in the system under Professor Cunningham, Professor of Anatomy, at Edinburgh University.

The Leith School Board have commenced a system of records on practically the same lines as the Glasgow records.

The Edinburgh School Board has not commenced any system of physical measurement but has lately appointed a medical officer for work in their schools. His whole time is taken by the Board.

Several other School Boards have appointed medical officers who devote part of their time to work in schools under the School Board.

Instruction in Swimming at Edinburgh; In connection with the physical well-being of school children, Swimming is receiving more attention.

The Edinburgh School Board have been arranging to extend the facilities for their school children attending the Public Baths in cases of schools which do not possess a swimming pond.

at Alloa; At Alloa, Swimming for school children has received considerable attention since the opening of the new baths and gymnasium.

at Stirling; The Stirling School Board have arranged for a number of their school children to attend the Alloa Baths on certain days in the week.

at Dunfermline. At Dumfermline the school children have the advantage of being able to use the Carnegie Baths, and to receive instruction in swimming and life-saving.

Ventilation. More attention should be given to ventilation in a number of schools, especially those which are aired by means of windows. Some of the country schools are especially bad in this respect.

The short periods of exercise between lessons should be utilised to air class-rooms.

APPENDIX II.

Report on Cookery, Laundry Work, etc., in the Southern Division.

(Miss Crawford.)

Cookery.

During the past year fifty-two classes in this Division were visited. The increase of classes and the frequent changes of teachers call, however, for more inspection. Classes visited.

One pleasing feature of the work has been the improved syllabuses of instruction in general use, in the framing of which are now found more uniformity of method and more suitably selected dishes for practice. Classes made to pay by cooking dishes of the cake and sweet nature are, however, still to be met, but happily the cases are few. In one class visited, the pupils were ordered to bring materials for cake-making from home, the teacher providing but two eggs and one slice of bread for the second part of the lesson. This pernicious system of begging materials from home connot be too strongly deprecated, and under no pretext should it be encouraged. Improved syllabuses, on the whole.

The disposal of the cooked food is to many teachers a source of anxiety. The difficulty, however, could in a great measure be overcome if these same teachers gave more attention to the way in which the food is cooked and served, and to the cost at which it is produced. Pupils cannot be expected to purchase what is quite uneatable for want of sufficient cooking, or what is of little value to them as food. Instead, therefore, of spending the first half-hour or more of the lesson on questioning, writing of notes, or other matters of minor importance, dishes requiring long cooking should first be prepared and the cooking process put into operation to ensure better practical results at the close of the lesson. Disposal of the cooked food.

In a few of the classes the numbers attending demonstration lessons have been reduced to eighteen or twenty as in the case of practical lessons, and, instead of a two hours' demonstration when the work is done by the teacher alone, the lesson becomes a practical and demonstration one combined. The pupils take their places at the table with the teacher, the necessary materials and utensils are brought forward, a few well directed questions on the past lesson lead up to the present, the actual preparation of the dish is expeditiously begun, the teacher meantime working with and supervising her class, the method of cooking is carefully explained, the work actually prepared by the pupils being used for illustration. The advantage of this is obvious. The dull monotony of a demonstration lesson to a large number of uninterested and weary pupils gives place to individual practice and activity; the pupils become more thoroughly interested in the work; and better opportunity is afforded of presenting at the end of the lesson dishes well and sufficiently cooked. Teaching by demonstration *and* practice has much to commend it and the plan might well be more generally adopted. Improved method for demonstration lessons.

Any signs of weakness and inefficiency observed were usually the result of apparent slackness and slovenly ideas of work. Teachers of domestic subjects seem to forget that pupils of the age of twelve to fourteen are terribly imitative in matters pertaining to the person and home; and that it is therefore the duty of every such teacher to bear in mind that her personality and example should be such as to exercise an inspiring influence on girls whose home surroundings are far from satisfactory. Nothing should be tolerated in a cookery class that we should not like to see or adopt in our homes. The folly of substituting a strip of unbleached, unhemmed calico for a table-cloth, in giving a lesson on table-setting; of using sieves for straining soup to a class of children in a working district city school; of teaching the making of cakes to the exclusion of useful cookery to pupils because they come from better homes; and of many similar absurdities is obvious without further comment Causes of inefficiency.

Value of interchange of views among the teachers.

Throughout this Division the teachers of Domestic subjects might follow the example of Glasgow and form an association, or at least endeavour to know one another. This would be specially valuable for young teachers situated in an isolated district and left entirely to their own resources. Interchange of views and comparison of methods are very helpful, and periodical or friendly meetings would prove beneficial all round.

Rural districts.

In many of the rural districts where a special teacher cannot be employed the subject awaits the qualified certificated teacher. The establishment of classes by the Provincial Committee for the training of such teachers is looked for to supply the want.

Edinburgh.

During the past year, every teacher employed in Edinburgh City Schools received a visit. In some of the older schools the equipment cannot be considered satisfactory, and, as reported last year, in the very schools in which only the open fire or range should be used, nothing but gas stoves still exist. In many of these schools, indeed, the Manual Instruction room is utilised for Cookery, and here, placed round or on benches, as many as fifty-four pupils are accommodated for a two hours' demonstration lesson. It is impossible to do good work under such conditions, and, if the effectiveness of the teaching is to claim first consideration, these large classes should be discontinued.

All the teachers employed by this Board are specialists, and it has been my pleasing duty to report most favourably upon the work of some of them, who never fail to make the lessons a real education, and who exhibit in their personality and in their minute attention to every detail of the work an ideal for the pupils to imitate. In other cases, however, much improvement is needed, particularly in connection with the teaching of cookery by correct methods, and in presenting to their pupils a higher standard of cleanliness and order. Again, referring to the schools in the poorer parts of the city, the teaching of this and the other domestic subjects would prove much more effective if proper kitchens were provided, whereby the work could be carried out on homelike principles and on lines better fitted to enable these girls to develop into capable, practical, and thrifty women.

Leith.

In Leith, many of the classrooms might be much improved. Few, if any, of them have the slightest resemblance to a kitchen; some indeed are the ordinary classrooms with gas stoves, a cupboard, sink, and a few tables introduced. One properly equipped centre for Cookery and Laundry Work is urgently necessary, chiefly for those girls who leave school at fourteen and have no further opportunity of receiving any real instruction in matters pertaining to the home. There is need for much further development of the work in this district; and it is confidently anticipated that the Board will provide the means for extending it on more successful and satisfactory lines.

Linlithgowshire.

At Linlithgow Academy, the work progresses very favourably; also at Bo'ness, Bathgate, Broxburn and Armadale.

Perthshire.

In the town of Perth large classes are daily being instructed at Caledonian Road Public School. Special Cookery rooms have been provided for Arngask Public School and Tibbermore Tulloch School, and at both places the subject is taught by a member of the staff. There still remain many schools in the county of Perth where no provision has yet been made for this branch of Supplementary Class work.

Fifeshire.

The number of classes in Fife district increases annually. Many of these are taught by the teachers of the Fife County Committee and are in operation while the Continuation Classes in the same village or town are in session. Successful classes were conducted on these lines at Saline and Thornton Public Schools. At Dunfermline (Burgh) Queen Anne Public School the teaching is excellent, but the premises are somewhat out of keeping with those of similar educational establishments in the burgh. A new and properly equipped centre is very necessary and, it is hoped, will be provided in the near future. The Dunfermline (Landward) and the

Beath School Boards employ specially qualified teachers for their schools and much credit is due to both Boards for the suitable premises they have attached to many of the schools. The teaching also is of a satisfactory nature. An excellent classroom adapted for Cookery and Laundry Work forms part of the Kirkcaldy North Public School, and every facility has been provided by the Board for the successful and practical teaching of both subjects.

Haddingtonshire.

In Haddingtonshire the number of classes remains stationary.

Border District.

In the Border District many schools have recently introduced the subject, and the standard of efficiency has much improved. In the larger towns of the district a specialist is employed, while in the rural districts—such as Ednam, where a class for boys has been instituted—the work is undertaken by the certificated teacher. At Eyemouth also excellent accommodation for Cookery and Laundry Work has recently been attached to the Public School, and instruction in the former subject is given to the boys as well as the girls of the Senior and Supplementary Divisions. The boys' classes promise well, and meantime their keen interest and their enthusiasm in the work surpass expectations.

Cookery for boys.

Stirlingshire.

In Stirling and Clackmannan districts, few of the classes were visited during the past year. Commodious and well-equipped classrooms for Cookery, Laundry Work, and Housewifery have been added to Kilsyth Academy; and at Falkirk a new "centre" has been opened for the teaching of Housewifery and Laundry Work. In the mining districts of Stirlingshire several new classes have been formed, and a teacher of Cookery is being appointed for the work of the schools under the St. Ninian's Board.

Laundry Work.

The number of schools in this division in which Laundry Work is taught has not increased to any appreciable extent.

Edinburgh and Leith.

In the city of Edinburgh instruction in this subject is given in five schools; while in Leith there are no classes.

Fife. Stirling.

In many of the other districts throughout the Division, particularly in Fife and Stirling, the subject is taken alternately with Cookery. Much of the work done at these classes has been from time to time favourably commented upon.

Special need for good handling of this subject.

The popularity and success of this branch of domestic training depend to a very great extent upon the enthusiasm and common-sense displayed by the teacher in handling it. Unlike Cookery, it can be made positively distasteful to the pupils and thus of little educational or practical value.

Value of the subject.

The idea exists in the minds of many educational authorities that, as public laundries are now spread broadcast over the country, and as the practice of giving out the family washing has become so common, there is little need for teaching Laundry Work in schools. This theory, however, does not hold good, for, apart from the educational aspect of the subject, a girl stands a poor chance of becoming a capable home manager if she is ignorant of the art of washing and dressing clothes. The subject would be more generally taught if, when Cookery premises are being erected or reconstructed, they were made larger and adapted for both purposes.

SECONDARY EDUCATION (SCOTLAND)

REPORT FOR THE YEAR 1907

BY

J. STRUTHERS, Esq., C.B., LL.D.

Presented to both Houses of Parliament by Command of His Majesty

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Report *for the year* 1907 *by* J. Struthers, Esq., C.B., LL.D., on Secondary Education in Scotland.

My Lords,

9th October, 1907.

I have the honour to present to Your Lordships my third Annual Report on Secondary Education in Scotland.

Regulations as to Grants to Secondary Schools.

In this connection the most important administrative event of the year has undoubtedly been the issue of the new Regulations as to Grants to Secondary Schools. Hitherto the only support which Higher Class Schools in Scotland have received from monies voted by Parliament has been the grant distributed in terms of Your Lordships' Minute of 30th May, 1903. That grant, however, was specifically destined to encourage instruction in the particular subjects of Science and Art, a method of payment which has long been recognised as educationally unsatisfactory, inasmuch as it implied the placing of a premium on certain selected branches of study. Under the arrangements now introduced, Science and Art will still have a place, and a prominent place, in the curriculum of any school to which financial aid is extended. But all temptation to emphasise them unduly will be removed. Henceforward the basis of grant will be the whole work of the school. It is unnecessary here to recapitulate the detailed conditions; they are fully set forth in the Regulations themselves. But a word or two of general explanation may not be out of place.

Whole work of school to be the basis of grant.

General conditions.

No grants are payable on behalf of any pupil who is under twelve years of age, or who has not satisfactorily completed what may be described as the elementary stage of his education. Once those requirements are met, every pupil is free to enter upon an Intermediate curriculum, the normal duration of which is three years, while its natural goal is the Intermediate Certificate. All curricula leading up to that Certificate have to be approved by the Department. In considering the proposals that are laid before us we endeavour to keep certain guiding principles in view, but to allow the school authorities as wide a discretion as is possible within the limits thus imposed. Our aim is to secure, first and foremost, a reasonable amount of attention to the mother tongue, and thereafter to make sure that a proper balance is observed between the linguistic and the realistic sides of intellectual discipline. By the time the Intermediate Certificate has been gained, the mind ought to be so far formed that pupil and teacher are in a position to judge of the direction in which further study can be most profitably pursued. During the remaining years of school life, therefore—that is, during the period of preparation for the Leaving Certificate—some degree of specialisation may be not merely permitted, but encouraged. The boy or girl who has developed a taste for literature and history, or for languages, or for mathematics and science, ought

Approval of curricula.

Intermediate.

Post-Intermediate.

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to be free to cultivate his or her particular talent, treating other school subjects as more or less subsidiary. And this is a consideration to which we shall be prepared to attach full weight in judging of the merits of the post-Intermediate curricula which are submitted to us for approval. All the evidence before us goes to show that it provides the only possible solution of a problem that is daily becoming more urgent. As matters stand at present, our secondary schools find themselves between Scylla and Charybdis. Not only the exceptional pupil, but even the average boy or girl, is required to keep fully abreast of too many subjects. Consequently, if a teacher sets his face against overpressure, he must deliberately countenance superficiality.

Too many subjects.

Possibility of improvement.

The alternative policy outlined above would change all this. The discipline of the Intermediate curriculum would prevent any undue narrowing of the intellectual horizon, while subsequent study along lines that were peculiarly congenial might confidently be expected to produce a better educational result than can reasonably be looked for under existing conditions. Further, the level of attainment in the Universities would be correspondingly raised, provided they were willing to adapt themselves to the new state of things. Pupils, no doubt, would have to continue rather longer at school. But this merely means that the leaving age of scholars in secondary schools in Scotland would approximate more closely to what is customary in other civilised countries. Additional staff, too, would almost inevitably be required in the great majority of cases. And here the new Regulations would be of very substantial assistance. Assuming that the curricula of the school have been approved, they offer a *per capita* grant of £3 on the average attendance of all properly qualified pupils who are studying for the Intermediate Certificate, and a similar grant of £5 on the average attendance of all holders of the Intermediate Certificate who are carrying their studies farther.

Better educational results.

Method of Payment.

Result of the new Regulations.

The net result of the Regulations, then, will be to give more adequate support to Secondary Education in Scotland, and at the same time (it may be hoped) to point a way of escape from a difficulty that is really grave. To prevent misunderstanding, it may be well to draw attention to the fact that incidentally they furnish the necessary complement to Chapter V. of the Regulations for the Preliminary Education, etc., of Teachers, since they specify definitely the minimum number of teachers on the staff of each school who must possess a special qualification to deal with some "higher" subject. The work of compiling a register of the teachers who gain such a qualification has now been taken in hand in earnest. It should be distinctly understood that, while every effort will be made to safeguard established interests, the standard as regards future applicants must necessarily be strict. It may be added that, though it is necessary for the present, owing to legal restrictions, to deal with Higher Class Schools under a separate set of Regulations, the Department hope that ere long it may be possible to assimilate to these Regulations

Qualifications of teachers of "higher" subjects.

Register of such teachers.

Future classification of Schools.

those which are now applicable to schools under the Code giving a greater or less amount of Secondary Education. Ultimately, therefore, the rank of a Secondary School will be determined simply by its ability to give a full course of Secondary Education.

Memoranda on the teaching of various school subjects.

In response to various appeals for guidance as to the best method of handling the different school subjects, the Department recently undertook to issue at short intervals a series of Memoranda. Four of these have now appeared, the subjects concerned being English, Arithmetic, Languages, and Drawing. Others are in active preparation. It must be remembered that these Memoranda are not put forward as final or authoritative documents. They are meant to be suggestive only. The views expressed embody, it is believed, the ideals and aspirations that animate the best schools ; and few, if any, specific recommendations are made which are not supported by the actual experience of teachers of repute. It is pleasant to note that there is every sign that the Memoranda are receiving the thoughtful consideration of teachers and managers, and that the general effect of their publication is likely to be entirely good.

Number and distribution of Schools.

The total number of 'Higher Class' Secondary (and Preparatory) Schools inspected during the past year has been 109, while the total number of Higher Grade Schools has risen from 141 to 155. A careful study of the way in which these are distributed goes to show that, nominally at least, the supply may be regarded as very nearly complete. It must, however, be admitted that in both classes there are individual institutions that have still to make good their claim to the rank to which they aspire. The most reliable test of efficiency is the extent to which pupils are successfully presented for Group Certificates (Intermediate and Leaving). A careful watch is being kept upon the performance of those schools whose position is at all doubtful. Should they fail to develop in proportion to their opportunities, the recognition they now enjoy will have to be withdrawn.

Overlapping in populous centres.

On two previous occasions I have alluded to the danger of overlapping that exists in certain populous centres where there is more than one authority warmly interested in the promotion of higher education. It is not to be forgotten that there are districts which labour under difficulties of a very different kind, —districts where the public conscience in matters educational is lax, where parents have an insufficient appreciation of the duty they owe to the abler among their children, and where, as a consequence, boys and girls are too often withdrawn from school almost as soon as they pass the compulsory age. It is in such districts that not a few of the weaker Secondary and Higher Grade Schools are to be found, and we feel that, in the circumstances, every effort should be made to nurse them carefully, in the hope that the mere fact of their existence may tend to encourage the growth of a sounder educational tradition. It is but right to acknowledge the valuable help which we have, in many instances, received from the enlightened co-operation of the Burgh and County Committees. So far as the provision of

Benefits of secondary education not fully appreciated in certain districts.

Co-operation of Burgh and County Committees.

opportunities for higher education is concerned, it is the opinion of the Department that these Committees, strong in their familiarity with local conditions, ought to be peculiarly well fitted to offer advice and assistance in determining how the resources available within their area can be utilised to the greatest advantage. If that is to be so, it is of course essential that their members should take a statesman-like, and not a merely parochial view of their responsibilities,—that in making an allocation of the funds at their disposal they should look to the interests of the county as a whole, not to the expectations of this or that particular corner within it. And one is glad to be able to say that this is coming to be more and more the case.

Subsidies to schools.

There are but few exceptions to the rule that, where direct subsidies are paid to schools, the local managers have earned a right to such assistance by incurring voluntarily the extra expenditure necessary to secure either Secondary or Higher Grade status.

Bursary system.

There is another function of the County Committees which is hardly second in importance to that which has just been described. In spite of all the help that can be given by the State, directly or indirectly, towards the provision of schools, there must inevitably remain whole tracts of country so sparsely populated that to plant a centre of higher education within easy reach of every child of ability would be absolutely impossible. Yet no child of parts should be defrauded of his opportunity. If the school cannot be brought to him, he can be brought to the school. Hence the stress which the Department has laid on the organisation, within each county, of a well thought out and properly articulated bursary system. The most serious obstacle that has had to be overcome in this connection is the widespread misunderstanding as to what the nature and object of a bursary is.

Opportunities for children in outlying districts.

Misconceptions as to bursaries.

Owing to a train of circumstances on which it is unnecessary now to enter, a bursary has come to be regarded as a prize, and patrons are too apt to consider that they have discharged their obligations when they have held a competitive examination and have handed over the money to the boys and girls who may have made the highest number of marks. Bursary money allotted on such rough and ready principles is to a large extent money misapplied. There is no means of knowing that it was really required by the recipient, and therefore no guarantee that it was spent upon the purposes for which it was originally intended. Furthermore, the very pupils who are most in need of aid—those who come from distant and poorly equipped schools—are practically certain to go down in an unequal contest with others, no more able than they, who have enjoyed the advantage of skilled tuition at the hands of a zealous staff.

Principles on which they should be awarded.

It has seemed well to state this general truth quite fully and frankly, because a deep conviction of its importance has underlain all the particular directions that the Department have addressed to the various Committees. It is most gratifying to be able to record that nearly the whole of the Committees have fallen in most cordially with the suggestions that were offered by

the Department. As a rule, they have endeavoured to arrange their bursaries so as to secure an equitable distribution over the different schools which can produce fully qualified applicants—that is, pupils who have definitely proved their capacity for profiting by a higher course of instruction than would be open to them without financial assistance. Competition has practically disappeared, except as between those who have been educated at the same school, and have, therefore, enjoyed the same initial advantages. A complaint is sometimes made that the amount of money that can be spared for the purpose is too limited. It is true that the total amount is limited. But this does not necessarily imply that it is insufficient. On the contrary, we have reason to think that, if properly distributed and administered, it would be ample to meet all genuine claims that could be made upon it.

Funds available.

The reservations just mentioned are significant. The share that falls to each county or burgh is determined by the number of inhabitants it contains. Even so far as the support of central schools is concerned, this principle of distribution is not altogether free from objection. In the case of money specifically ear-marked for bursary purposes, its unsatisfactory character is immediately apparent. The districts where the population is thinnest are precisely those where the need for bursaries is greatest. Central schools are few and far between, facilities for daily travelling are scanty, and attendance becomes impossible unless the bursar can board within a reasonable distance of the place where he is to receive his instruction. To meet this difficulty in these parts of the country where it is most acutely felt, the Minute of March 9th, 1907, definitely reserved an amount not exceeding £2,000 for the provision, by the Department, of additional bursaries in the counties of Inverness, Argyll, Ross, Sutherland, Caithness, Orkney and Shetland, these bursaries to be awarded on consideration of proposals submitted by the Secondary Education Committees of the counties named. As to right administration, I have already expressed the opinion that the Committees, as a whole, are realising to the full the responsibility that rests upon them for the use that is to be made of public money. Several of them are most wisely endeavouring to get into touch, each within its own sphere of influence, with the governing bodies of the different educational endowments that are scattered in such large numbers over the length and breadth of Scotland. Pending that general revision of endowment schemes, for which the time is already more than ripe, well-considered action on the part of the Committees might go far to bring about a measure of co-operation which would at least prevent the more flagrant forms of waste. It is to be feared there are still cases in which, without regard to the action of Parliament in freeing elementary education and in raising the limit of compulsory attendance, pupils under fourteen years of age receive "bursaries" to enable them to attend schools which are at their own doors and from which fees have long since disappeared. In other words, certain

How the money is distributed.

Additional provision for outlying and sparsely populated districts.

Educational endowments.

Waste not unknown.

privileged parents are receiving money compensation for discharging an obligation imposed upon all citizens by law.

Two classes of bursaries, Intermediate and Secondary.

Practically the whole of the schemes of the various Committees recognise two classes of bursaries, Intermediate and Secondary. The former class are tenable at schools which provide higher instruction up to the level of the Intermediate Certificate. The latter are awarded only to pupils who already hold the Intermediate Certificate—including accepted Junior Students—and who desire to attend a Junior Student centre or, alternatively, a school where they can be prepared for the full Leaving Certificate. It will at once be seen to what an extent this new system enhances the position of the Intermediate Certificate. Taken in conjunction with the Regulations as to Grants to Secondary Schools, it makes that Certificate one of the most important pivots in the machinery of our educational organisation. A year ago I described at length the modifications that had been introduced in anticipation of the change. The most conspicuous of these was the recognition of the right of the school authorities to have some share in determining the question of a candidate's success or failure. So far as the wishes of the Department go, there is every desire to attach increasing value to the opinion of the teachers on the attainments of their pupils. After all, who should be more familiar with their strong points and with their weaknesses? At the same time, it will be readily admitted that the path on which we have entered must be pursued with due caution. We cannot afford yet awhile to dispense with a most rigid scrutiny of the results of our own written and practical tests. But, as was explained in my last Report, no candidate is allowed to pass, or to be set aside, without a careful weighing of the facts of his school history—the reasoned opinion of the Headmaster as to his general attainments, the marks assigned him by the teachers of particular subjects, the relative position he occupies among his class-fellows, and the like.

The Intermediate Certificate.

Weight attached to teachers' recommendations.

The general result.

The labour of going through the many schedules was again lightened materially by the satisfaction with which one was able over and over again to acquiesce in the Headmaster's verdict. And this was conspicuously so in the case of some of the schools from which the presentations were most numerous. There were, of course, contrary instances. In a few schedules nearly every name was doubtful or something worse. No doubt ignorance of what constitutes a reasonable standard was in the main responsible. On the other hand, teachers who mark about a third of their pupils as worth 100 per cent. in one or more of their subjects display a lack of discrimination that raises grave doubts as to whether it is possible to attach any weight to their opinion at all. Due note is kept of examples of the kind. If good cause be shown, we shall not hesitate to inflict the penalty of which I spoke last year, and to disqualify the whole of the candidates from a school where such irregularities are obviously deliberate. It is, I find, desirable to repeat what was previously said as to the necessity for each teacher assessing his marks upon

a common standard, so far as his own subject is concerned. He need not trouble as to what his colleagues do. Where he can really help us is in giving a reliable estimate of the *relative* merits of the different candidates of whose training he has himself had special charge. And there are one or two other points of which it may be well that school authorities should be reminded. In 1908 and following years no pupil will be accepted as a candidate except from a school whose Intermediate Curriculum has been definitely approved beforehand. Further, presentation must be simultaneous in all subjects, and it should always be made on the Lower Grade Standard. We permit an exception only where the Intermediate Curriculum, in addition to its normal elements, makes provision for instruction in some extra subject such as a second foreign language. Here it may well be that the time allowed has not been sufficient to admit of the candidates being able to face the Lower Grade paper. Accordingly we are satisfied if, in the particular subject concerned, the teacher gives us his estimate of the value of the work done by each pupil on the ground actually covered and leaves that estimate to be tested by the Inspector on the occasion of his visit to the school.

Conditions of presentation in 1908 and subsequent years.

Coming next to the results of the recent Examination, I find that this year the number presented for the Intermediate Certificate has been as nearly as possible doubled, a phenomenon which finds its explanation in the circumstance that the importance of gaining the Certificate has now for the first time become fully appreciated. I am glad to say that there has been a corresponding increase in the number of successes. After full consideration we have been able to award Intermediate Certificates to no fewer than 3,748 applicants, whose performance during the Intermediate stage of their school course we had reason to regard as satisfactory; for this, and not the actual tale of passes, is what we consider the touchstone. Many of these will no doubt become Junior Students. Others will follow curricula leading to the Leaving Certificate. Leaving Certificates are intended to attest ripeness for University study. They are still awarded under the conditions laid down in Circular 340, and here too a gratifying increase falls to be recorded. The number of successful candidates is 725, an advance of nearly 150 upon the highest total previously attained. Regarding the various special forms of Leaving Certificate, there is little that is new to be noted. Four Candidates were presented for Special Group Certificates, and all of them passed. The three applicants for Army Certificates made an equally satisfactory appearance. I may add that there are now seven schools whose curricula have been approved for Army purposes, and whose pupils can accordingly, through our Certificate, obtain exemption from the examination of the Army Qualifying Board. Technical Certificates were awarded to six out of seven candidates. Only in connection with the Commercial Certificate were the results markedly unsatisfactory. With two exceptions, the ten candidates who were presented

Increased number presented for Intermediate Certificate.

Number of Intermediate Certificates awarded.

Leaving Certificates.

Special Group Certificates.

Army Certificates.

Technical Certificates.

Commercial Certificates; unsatisfactory results.

had to be rejected as failures. It is clear that there is still a very long way to travel before the question of Commercial Education is adequately solved. There has been some stirring of the waters in our large towns, and advisory committees have been formed both in Edinburgh and in Aberdeen. But it may be doubted whether any real progress is to be hoped for until men of business realise that lads who become apprentices at fourteen years of age cannot possibly be expected to have received anything that is worth calling a Commercial Education, and that, if the prospective apprentice is to undergo any proper discipline of the kind at school, he must remain there until he is seventeen, and must consequently have privileged treatment accorded him in respect of salary or position when he does enter an office.

The Written Examination in 1908.

Next year will witness some not unimportant modifications in the arrangements connected with the Written Examination.

Honours papers discontinued.

The Honours papers will disappear, and opportunity will thus be afforded for improving those set for Higher Grade. The Higher Grade English paper, for example, will be lightened by the institution of quite separate papers for History and for Geography. Specimens of the latter have already been published.

Separate papers for History and for Geography.

Then each of the present Higher Grade papers in Latin, Greek, French and German will be broken up into two parts, and room will be found for dictation in French and in German. The general effect will be to lessen considerably the heavy strain which the actual examination imposes upon the pupil.

Other modifications.

Lastly, the written papers will be taken immediately before the Spring vacation. Apart from other advantages, this will materially facilitate the development of the system under which we invite the school authorities to co-operate with us in arriving at a judgment on the attainments of their pupils.

Change in date of Examination.

Reports of Inspectors and Revisers.

As usual, I have received most useful and informing reports from the Inspectors who have visited the different schools, and also from the revisers who have assisted in the arduous work of assessing the values of the written papers. The following remarks upon the individual subjects are suggested by a collation of all the information thus placed at my disposal.

ENGLISH

The position of English.

On the whole, it may fairly be said that the paramount importance of English is being more and more widely recognised. It is, I should explain, a subject to which we naturally attach very great weight in estimating the fitness of pupils to receive the Intermediate Certificate. Though a pass in English is not actually made a *sine quâ non* of the award, any candidate who does fail must establish an exceptionally strong claim for himself on the rest of his work; and there is an irreducible minimum without which none can hope to be successful. The reports of our Inspectors go to show that steady progress is being made in the direction of a better organisation of the time available for the study of the mother tongue. In many schools, however, there is still great need for a proper co-ordination of

all the efforts bestowed upon it. It frequently happens that classes are passed on from teacher to teacher in successive years without any right understanding as to the ground which is to be covered in the different sections of their course. A well thought out *Lehrplan* would not only save much time, but would also be productive of greatly increased efficiency.

Oral Composition improving.

It is gratifying to be assured that oral Composition is steadily improving; it is quite common now to find pupils who can connectedly and in good, fluent English relate an incident, and describe a character, a place, or an historical event. It seems, however, that indistinct speech and glaring provincial defects of pronunciation are as frequently found as ever, sometimes singly and sometimes in combination. The growing interest in Phonetics among our teachers should ultimately work an improvement in these respects, particularly if systematic speech exercises are regularly practised in the earlier years of school life. More attention is being directed to the mapping out of courses of Home Reading. In some schools a list of books for each year of study is drawn up at the beginning of the session. It is carefully graded in difficulty, and it gives scope for individual choice. The pupil is not expected to read all the books on this list; he may do so, of course, but all that is necessary is that he should make choice of a varying number—from six to twelve—in each year, with which he has to profess just so much acquaintance as may reasonably be expected from careful and attentive reading done at home. An incidental advantage of this is that it often stimulates the interest of parents in the intellectual development of their children. And to achieve such an end is an aim of the highest importance. The sense of literature, like the sense of history, is hard to implant, unless the work of the school is aided by the influence and atmosphere of the home. But even the school can do much, and one is glad to believe that, in the words of one of our Inspectors:

Defects of Speech.

Home Reading.

"There has set in during recent years a strong current leading towards greater breadth and appreciation. The classes are gradually shaking off the incubus of a somewhat barren formalism, too long fostered by classical tradition, and are escaping to the fresher inspiration born of contact with the works of the masters."

Decided advance in the Lower Grade

The evidence furnished by the written papers in English fully bears out the testimony of the visiting Inspectors. In the Lower Grade the Chief Examiner reports a steady progress in the teaching of English and the growth of a clearer conception as to the standard required; the wholesale presentation of immature candidates, so common in former years, has almost entirely ceased. But he makes the following general observation, which teachers would do well to ponder; no doubt the evil complained of is simply part of the general looseness and inexactitude of the growing mind, but that is no reason why something should not be done to mitigate it:

The main fault.

"Good as the results are, they would have been still better but for the prevalence of a fault which, though probably not more common than in

previous years, stands out more conspicuously now owing to the general absence of other serious defects. This fault is neither ignorance nor inaccuracy, but mere irrelevance. I find reviser after reviser complaining that the candidates answer not the question asked, but something superficially like it; or answer a part of a question, but not the whole; or overlay correct answers with alien matter to which no value can be given. It is clear that more marks have been lost from this one cause than from all other causes put together."

Detailed statement of results.

Apart from this, the results of the Lower Grade paper, taken all over, appear to be such as may gratify any reasonable expectation on the part either of the Department or of the teachers. Penmanship, Spelling and Grammar are almost invariably good. Dictation is decidedly above the average in respect not only of spelling, but of punctuation and the employment of capitals. The proper use of the apostrophe and the syllabling of words divided in writing are points that still call for attention. The essays, it is true, did not display much originality or imagination; as it happened, the theme which gave most scope for these qualities was generally avoided, and required for real success an amount of information which few of those who tried it actually possessed. But, if there was not much originality, there was plenty of free and vigorous writing; some of the battles, in particular, were described in a vivid and spirited fashion. On the whole, there is convincing evidence that our Scottish schools are steadily improving in Composition, the most difficult branch of all to teach. In this connection an interesting fact is noted by more than one reviser—the superiority of medium-sized over large schools; doubtless those who draw attention to this are right in attributing it to the greater amount of individual attention received by the pupils. The simple question in Literature set to Lower Grade candidates produced proof of a considerable width of reading. Much good poetry was quoted—though sometimes in a very illiterate way, without punctuation or indication of the beginning and end of lines, and defaced by errors which showed that the verses had been learned entirely by ear—but few of the candidates gave convincing reasons for their admiration, or pointed out poetic beauties. These results suggest two reflections to the Chief Examiner:

"(1) Dictation of verse should be practised in our schools as well as dictation of prose. (2) In selecting verses to learn by heart more should be left to the pupils' own choice. It is idle to expect them to admire to order. Taste and judgment develop slowly; we must not try to force them, but, finding out and accepting what the children naturally like, slowly cultivate their appreciation of the good into a preference for the better."

Some improvement in the Higher Grade.

In the Higher Grade also the work has improved, though the improvement is not so conspicuously noticeable. The result, so far as it goes, is satisfactory and points to genuine progress in the teaching of English, more especially in the teaching of English Composition. The most marked defect, alike in Language, in Literature, and in Prosody, was weakness of the generalizing faculty. In the Language section of the paper, for instance, a definite divorce was observable between the broad ideas of linguistic history and relationship which had been impressed upon the pupil's memory, and the particular examples with which

he had also been made familiar. There is a consensus of opinion that the essays show a distinct advance in facility and power of expression, a better grasp of the main principles of composition, and, on the whole, less of the feebleness and irrelevance which used to mar this part of the work. One of the subjects offered was to give a description of a picture. It is interesting and significant to find that many of the papers of those Glasgow pupils who chose this topic "revealed in their writers not only accurate and artistic observation, and retentive memory, but power to describe the objects of both in no unfitting and in no impersonal manner." It is evident that, if teachers in large cities are in some ways at a disadvantage, there are compensations open to them, if they are wise enough to utilise them. The teaching of English Grammar still compares very unfavourably with the teaching of the corresponding branch of Latin and Greek. There is no need to erect it into a separate subject. The careful study of a single play of Shakespeare, under the guidance of a teacher who understood Shakespearian idiom, would give all the training that is required. Shakespeare, by the way, is widely and assiduously read. But it was surely an amazing judgment that had compelled boys and girls to spend the session in studying *Othello*.

Grammar weak.

As to the Honours papers, a very few words will suffice. The quality of the work done all over—even when candidates did not reach the pass mark—struck the reviser as being distinctly better than it was last year. There was not so much verbal repetition from text-books of literature; and second-hand criticism was not so much in evidence. On the contrary, the answers seemed fresher and more individual, as if they were the fruit of personal study of the masterpieces themselves.

Improvement in Honours papers.

HISTORY

There is distinct evidence that a good deal of thought is now being devoted to the question of how History can most profitably be studied in schools. A full statement of the Department's views is reserved for the Memorandum on the Teaching of History which it is proposed to issue shortly. In the meantime, it may be enough to state quite briefly the main defect of the present system. The History lesson consists, to too large an extent, of reading and note-taking on the part of the pupil, combined with questioning on, and possibly amplification of, text-book facts and opinions by the teacher. As a consequence, the written papers show that the power of tracing causes and effects is not strong. Neither the ordinary teachers of History in our schools nor the ordinary text-books there employed lay sufficient stress on this simple truth—that for us the really important things in the past are those which influence the present. As regards method, one would like to see a much closer connection maintained between the study of History and the study of Literature. The list of books for home reading ought certainly to include some first-rate examples, either of fiction or of biography, bearing directly on the period of history on which

Memorandum to be issued shortly.

The present system.

the pupils are at the time engaged. Such reading would give them a better knowledge of social conditions and of the personality of the great figures than can be got from mere text-books. At present it may be said that, so far as the imparting of information goes, not a little solid work is done. Within the limits indicated, the answers to the written papers were quite creditable.

GEOGRAPHY

Memorandum in preparation.

Here again there will presently be a suitable opportunity for drawing attention at some length to the possibilities of the subject, and to the means by which these are most likely to be realized. One is glad to be informed that a notable development in certain new directions has already taken place—a development which may be expected to proceed with increased force, as the scientific and practical aspect of Geography becomes more and more clearly apprehended. And it is satisfactory to learn that the official provision of Ordnance Survey maps for educational purposes at a cheap rate is proving of the utmost benefit. Perhaps, however, the most hopeful sign of the future is the fact that Geography is shortly to be accorded the rank of a fully privileged University subject. When a proper supply of specialist teachers is available, a marked rise in the standard of efficiency may confidently be looked for. The written papers showed that a considerable mass of facts had been accumulated by the great majority of the candidates, but that, precisely as in English and in History, little systematic effort had been made to cultivate the generalizing faculty.

Signs of progress.

CLASSICS

Though the average level of attainment reached in Classics in Scottish schools is not as yet conspicuously high, much of the teaching is sound and thorough, and the prospects of the subject seem to be quite reassuring to all but immoderate expectations. The quality of the work in Greek is specially good, and Latin may be expected to show an improvement when it is attempted by fewer pupils. The most noteworthy advance that falls to be recorded is undoubtedly the agreement which has been reached as to a uniform system of Latin pronunciation. The attitude of most teachers towards the "new" pronunciation appears to be entirely sympathetic. But the habits of a generation or more cannot easily be changed; and for some time to come there will be need of tact, patience and tolerance. The change in itself is admirable. A scientific pronunciation is required in any language studied, not merely for the sake of the pronunciation itself, but also for the indirect effect it must have in emphasising the necessity of the appeal to the ear. The excellent practice of committing selected passages to memory is now general, but it might be carried even further than it is; it helps to cultivate accuracy in the matter of quantities, and in the case of prose gives advanced pupils at least some notion of the cadence of the sentence and the period. In spite of all that has been said in favour of oral composition, it is to be feared that there is as yet

Prospects reassuring.

Latin pronunciation.

Some weaknesses.

but little progress to chronicle in this respect. It seems absurd, but it is true, that in much of the oral work that is done prose order is uncertain; the ear has been forgotten. In the matter of composition generally, the fallacy of setting passages of undue difficulty remains far too prevalent. And *Realien* are too much neglected; in all but a few schools the necessary apparatus for illustrating what is read is absolutely lacking. Lastly, accidence for its own sake is still an idol of the class-room, particularly in Latin. The matter is thus summed up in a valuable report from one of our Inspectors:

"In this as in other parts of the school work too many teachers have no true perspective, no power to discriminate between the universal and the particular,—the point that *must* be known, and the minor point that it is quite pardonable to forget."

Written work.

As regards the written work, I have this year received from the Chief Examiner a report of such interest as to justify quotation almost *in extenso*. It is most striking to see how the defects of method to which the visiting Inspectors draw attention find their inevitable Nemesis in the written papers, and that, too, although these defects are almost without exception due to a mistaken zeal to drill the pupils for the very tests in which the weaknesses are so marked. He says:—

Lower Latin

Percentage of failures.

"The percentage of failures to passes remains high. Several Revisers report that the knowledge of some candidates was practically *nil*. This can only mean that it is not understood in all quarters that the Lower Grade is meant to represent a definite, though not an advanced, standard of attainment. Some schools seem to present pupils on chance. It is noted, however, by more than one reviser that the number of candidates who failed, but came within ten or twelve marks of a pass, has increased, and this is encouraging so far as it goes.

Accidence.

"A point that comes out very clearly is that the accidence is much better done than the rest of the paper. It even appears that there is a considerable number of candidates who do the accidence almost correctly nd yet are incapable of translating the simplest English sentence into Latin. It need hardly be said that, where this is the case, it points to the use of utterly wrong methods of teaching. A pupil who is familiar with a sentence like *diu et acriter pugnatum est* will not be puzzled when he is asked for the adverb formed from *acer*. He knows it already as a real and living thing. On the other hand, it is extremely difficult for an immature mind to apply knowledge which has been conveyed to it in the form of lists. Experience seems to show that the best test of all is the translation of simple idiomatic sentences from English into Latin. It is an even better test at this stage than continuous prose. The power of writing this comes, if it comes at all, later on, and the sort of prose that is written by younger candidates is continuous only in the sense that the sentences do not begin at the beginning of a line. It seems to follow that what is chiefly required is that more stress should be laid on the translation of easy sentences into Latin, and that less importance should be attached to the conjugation of verbs and the like, which is mainly an affair of memory. Good results will never be achieved until it is understood that the pupil must do something himself; must create a Latin sentence, instead of merely learning to reproduce more or less accurately so many pages of a grammar.

Translation of easy, sentences into Latin.

Scansion.

"The revisers report that some progress has been made in the matter of scansion, but the remarks they make as to the mistakes which were of most common occurrence show that this is still regarded as an exercise for the eye rather than the ear. The majority of candidates went wrong because

they supposed that *locus* and *habet* have their first syllables long. I venture to say that this is not their fault. It is clear that they have been allowed to pronounce *lōcus* and *hābet*, and very probably they have heard their teachers do so. If that is so, they were perfectly right in following the guidance of their ears. If any trouble had been taken to secure the right pronunciation, these mistakes would have been simply impossible. The failure in translating from Latin into English was mainly due to defective vocabulary. Some of the commonest words seem to be quite unknown. In paper after paper, *mulierum* was translated 'of mules' or 'of mule-drivers.' This would be impossible if the construction of simple sentences were made the foundation of the teaching. A peculiar difficulty arises in the case of most girls' papers and of those done by a good many boys. There is a marked tendency to supply the deficiency of the Latin vocabulary from the French. Thus 'proud' is *fierus* and 'mad' is *follus*. This means, it is to be feared, that French is now taught in a more rational way than Latin, and that its vocabulary is therefore more readily available. It is also clear that, though it leads to such strange results, this plan of extending the Latin vocabulary is based upon a sound instinct, and that something might be made of it under proper guidance. Without going far into Romance philology, it would be possible to teach one's pupils that *fier* is *ferus* and a few things of that sort. Both words would be better remembered, and the change of meaning is instructive in itself.

Defective vocabulary.

"The history questions appear to show some improvement; but there are some mistakes which should be impossible. In at least two papers Nero was credited with having besieged Troy for ten years, and taken it in the end by introducing a wooden horse. Several candidates confused Gracchus and Bacchus. This means that, in the schools from which they came, no attempt is made to give the pupils a general outline of the legend and history of the ancient world. It is not too much to say that such an outline should be regarded as an essential part of education. It is not, perhaps, of any great value in itself; but it gives the pupil a skeleton which he can gradually clothe with flesh and blood. Without some such outline, it is impossible for young minds to assimilate what they read. In former days, this outline used to be given through English Reading-books, which were thus made to serve a double purpose. It is also noticeable that such things as the legend of the Seven Kings of Rome appear to be avoided, presumably because modern criticism has thrown doubt upon their historical accuracy. Such considerations should have no place in school teaching. The things that never happened are often more important than the things that did, and historical criticism is not in place at the earlier stages of teaching."

Some improvement in history.

Higher Latin

"In Higher Latin it is satisfactory to note that there is a very marked improvement. The percentage of passes is larger, and that of discreditable failures is smaller. The improvement seems to show itself all through the paper. The scansion is much better, many papers getting full marks for this. The history questions also showed improvement.

Marked improvement in Higher Latin.

"The defect which comes out most clearly is that of vocabulary. It is surely remarkable that many good candidates, candidates who have passed quite easily, do not know the meaning of *amoenus* or *opacus*, or even of *fluvius*. This points to the same faulty method which I have spoken of in connexion with the Lower Grade papers. One feels that there is a want of background, so to speak, in the candidates' knowledge of the subject. They have not read enough or in sufficiently large masses; but have gone through a few books, so that it is a mere matter of chance whether they have ever met with some of the commonest words in the language or not. There can be no doubt that this is the chief source of the weakness shown in good papers here and there. There is no other possible foundation for knowledge of a language than the reading of it in large masses without notes and without minute comment and parsing. It is only when this foundation has been laid that the finer kind of interpretation is anything but a weariness. When a boy has read half-a-dozen books of Livy, with a translation if need be, he will be interested in, and will profit by, a minute scholarly

Defective vocabulary.

Necessity for reading in masses.

interpretation of a portion of what he has read. As things are, it is the practice of parsing all the irregular verbs and 'accounting for' all the subjunctives as he goes along that kills his interest in the subject and makes classical training the barren thing it often is."

Lower Greek

"The number of candidates presented for Lower Greek is again larger this year than last, and, what is still more satisfactory, the standard is well maintained. It is specially gratifying to find that the translation of sentences from English into Greek is better done every year. The reviser says :—'At one time candidates who scored well in other parts of the paper failed here, but now the majority of the candidates make a fair proportion (in many cases a large proportion) of their marks by this question.' As I have said in discussing the Lower Latin papers, this is the best test. A pupil who can turn into Greek sentences of the kind usually set in this paper has the key of the language in his hand. It would probably be wise to develop this part of the paper still further, as the schools appear to be ripe for it. It is more valuable in itself and a better test of attainment than the mere identification of isolated verbal forms, which is naturally found more difficult by most candidates.

Increased presentations.

Standard satisfactory.

Higher Greek

"The results of the Higher Grade paper in Greek are the most satisfactory of all. The number of candidates is larger than last year, and there is at the same time a distinct advance in the quality of the work. The reviser says : 'Only a negligible proportion of the candidates failed to come within a measurable distance of the pass standard.' It is evident that Greek is now taught in our schools on sound methods, and by teachers of great competence and enthusiasm. Some of the Higher Grade schools of the West of Scotland are deserving of special commendation.

Results very satisfactory.

Methods sound and teachers competent.

"It is also satisfactory to note an improvement in the Homer translation. The day of books of 'Unseens' seems to be passing away, and there is evidence that, in some schools, Homer is at last being read in large masses. That should be a matter of course everywhere.

"There is really only one feature in the teaching of Greek that calls for serious criticism, and that is, that in many schools the pupils are still made to memorise forms of verbs, which, as the reviser says, are either not met with at all, or only found sporadically. This can only be done with the view of training the pupil's memory ; for it cannot help him to learn Greek. But surely it would be better to train the memory by learning something of real value. The pupil must, of course, know a certain number of irregular verbs, if only because they are the commonest words in the language ; but these are really very few in number. It should be possible for almost any pupil to know them infallibly ; and, if he does, he will easily be able to deal with the others when he meets them.

One unsatisfactory feature.

Honours Latin and Greek

"In the circumstances, it is hardly necessary to say much of the Honours papers in Latin and Greek. In Latin, the general character of the papers appears to be much the same as in previous years, and in particular, there is the same suspicion of cramming about the literary and historical questions. In the Greek paper, this comes out even more strongly. It is evident that some of the candidates have tried to get up subjects for which their previous training has in no way prepared them. In one paper, the 'Homeric question' has left the following obscure trace : 'Homer nowhere mentions war-engines, and as these were used by the Romans, the Homeric poems must have been of earlier date.' Another candidate says : 'Theocritus was the only poet of any note who wrote in the Greek language after Pindar.' These remarks are quoted in order to reinforce what I observed above, the want of any systematic effort to give the pupils even a bare outline of the history and literature of Greece and Rome. One sees that the candidates who gave these answers have been trying to get the subject up with a view to the

Some evidence of cramming.

examination, but that they have no idea of where to fit in what they read. The re-action against the memorising of dates and titles of books was no doubt justified by the excessive importance formerly attached to such things, but it has evidently gone too far. We might learn a great deal from French methods of teaching in this respect. As in the case of the irregular verbs, what has to be memorised should be reduced to a minimum, and then memorised faultlessly.

General impressions.

"To sum up. The general impression which I have formed from the papers which I went through and from the reports of the revisers is that Greek is taught in a more rational way than Latin, and that it is being better taught every year. If the grammar could only be simplified a little more, there would be no serious fault to find. Latin suffers from not being read in masses, which leads to defective vocabulary and want of freedom in dealing with the language. All subjects suffer from the absence of any scheme or outline into which new knowledge can be fitted as it is acquired. These are faults which it should not be hard to remedy."

FRENCH

Satisfactory progress.

The study of French continues to be pursued with steadily increasing earnestness and enthusiasm. Progress is as yet most noticeable in the earlier stages, although in not a few of the schools its rate is hampered by the presence, during the first and second years, of pupils who have no intention of continuing their attendance after they reach 14, and whose proper place is therefore in Supplementary Courses.

Qualifications of teachers.

Existing teachers continue to strengthen their qualifications by attendance at classes at home and by taking vacation courses abroad—a form of self-sacrifice that is altogether admirable; it is of the utmost importance that those responsible for the instruction of any class, from the youngest upwards, should have an ordered idea of the system of French sounds and such a knowledge of living French idiom as

Recitation.

implies a power to use it in actual class-work. Recitation is practically universal, but the quality of it varies greatly; its possibilities are not yet fully appreciated, and it is often regarded as merely another task, without much relation to the rest of the work.

Oral composition.

The testimony of our Inspectors is unanimous as to the supreme value of oral composition, when it is conscientiously and intelligently practised.

Reading-books.

Considerable difficulty seems to be experienced in choosing suitable reading-books. Some teachers are too prone to select works that are unduly hard, on the old-fashioned theory that it is an advantage to learn the maximum number of hard words with the minimum amount of reading. As a matter of fact, the very opposite is the case. And in any event there ought always to be at least one text written in the simplest style, which can be profitably employed as a basis for oral work and as a medium in which to study in concrete form the leading principles and characteristic phraseology of the language. The effect of proper oral drill upon written composition is far from being adequately realised. Still, there is a distinct advance even here. The book of hard English extracts is slowly disappearing. Teachers are becoming less reluctant to substitute for the style of Burke and Sydney Smith something direct and simple.

Written exercises.

The correction of written exercises, however, is often unsatisfactory; they should be set less frequently and supervised more vigilantly. At the same

time the interest in the work is growing. The system of exchange with France, too, is developing satisfactorily, and promises to have highly useful results in two directions. On the one hand, Scottish pupils are deriving distinct benefit in the immediate present. On the other, the army of teachers is receiving a body of recruits who have undergone a very special form of training, and whose influence on future generations of pupils ought to be all for good. Interchange of student teachers with France.

As regards the written papers, I subjoin some extracts from the Chief Examiner's report. Written Papers.

LOWER GRADE

"The revisers, with one partial exception, are agreed that in the Lower Grade there is a distinct advance on the performance of last year. The number of the 'very good'—that is, those who obtain three-quarters of full marks—has not increased, but the hopeless failures—that is, those who fall below one-quarter of the maximum—are much fewer. The average age of the candidates is higher, and there is not such a large presentation of candidates who, as their teachers should have known, are predestined to fail. This improvement is particularly noticeable in the Free Composition. The fairy story set this year did not perhaps give so much scope as usual for invention and originality of treatment. Yet the majority succeeded in telling it so that a Frenchman would have grasped the meaning, and this is the most convincing proof that the language has been studied to some effect. Distinct advance in Lower Grade. Free Composition.

"In the rendering of the set passage into French there was also some improvement, though not so marked as in the Free Composition. There were fewer solecisms and violations of the first grammatical concord. The prevailing defects, to which the attention of teachers should be directed, are as follows:—1. Ignorance of the conjugation of the commonest irregular verbs—*aller*, *venir*, *vivre*, *voir*. This does not imply that there should be more of formal grammar teaching, but simply that there should be more of conversational practice. These verbs should be used so frequently that the correct form becomes automatic, as in the native language. 2. In syntax, the confusion of *ce* and *il*, of *comme*, *comment* and *combien*, the indicative after a verb of wishing, and the use of a present where the more logical French requires the future. All these are such familiar stumbling blocks that the pupil's attention should be specially directed to them and correctness secured by systematic drill. 3. The common complaint of examiners as to limited vocabulary appears to me often over-charged, and the high pretensions of the Gouin method have not been, in my experience, justified by results. But in the passage set this year there was no word that a French infant of three would not have known, and such words as 'dress,' 'pair of shoes,' 'handkerchief,' 'corner,' should have occurred in class-room conversations, parts of the body and dress being obvious topics to begin with. 4. Blunders such as *un joli un*, *nous aurions le manger* ('we should have to feed it'), *je viens à un pis bout* ('I am coming to a worse end') will occur to the end of the chapter, and can only be eradicated by raising the general intelligence. Yet it is worth while pointing out that nearly all attempted a literal version of the last-quoted idiomatic English phrase, and also that only one in five hundred rendered 'Fluff' by *minet*, though scores must have met with the word in children's stories. Evidently the reader is not sufficiently used in teaching French composition. Translation into French. Prevailing defects.

"The translation into English was fairly done by most, but very few gained extra marks for style. Most versions were painfully literal, often even when 'the letter killeth.' Thus, 'I have the honour to salute you' for 'I wish you good day.' Even in the early stages anglicized French should be banned and barred. Translation into English.

HIGHER GRADE

"Here, too, the majority of the revisers report a marked improvement. One, however, notes that many candidates ought never to have been Marked improvement

submitted, and all are agreed that, though there were few absolute failures few attained high excellence.

Criticisms.

"Incidentally, it may be mentioned that in the story set for Free Composition many displayed a gross ignorance of some very elementary facts of natural history.

"To the set composition the criticisms passed on the Lower Grade apply in a modified degree. That very few knew the French for 'rheumatism' or 'lady author' I count a venial shortcoming, but such words as 'needle,' 'income,' 'fame,' 'to pay a call' should have been familiar to all, not to two-thirds or less. But I reckon it a far more serious blot that nine-tenths of the candidates should have begun their composition with '*Maintenant que je sais quelque chose de vous*' or its equivalent. It points to the 'evil wrought by want of thought.' Some other prevailing blunders may be pointed out: reflexive verbs conjugated with *avoir*; *un peu d'eux* (for *peu d'entre elles*); *ici se trouve* or *ci gît le secret* (for *voilà*); *travailler avec leurs aiguilles*; and *nom de plume*—the last a piece of journalistic English that it is hard to eradicate.

"The passage of French prose for translation presented no difficulties of vocabulary, and the general meaning was fairly interpreted by most. Only some five per cent. on a rough calculation made utter nonsense of it by such blunders as *un malaise général* 'a Maltese general,' or *un coche* 'a pig stye.' On the other hand, such mistakes as 'a free head' for 'a clear brain,' 'I could not wish' for 'I cannot form a wish,' 'I have dark ideas of melancholy' (with a total disregard of commas), were too frequent; and hardly one gave correctly the idiomatic '*C'est comme cela que j'ai fait le tour du monde.*'

"The French poetry was a good instance of the difficulties concealed beneath what appears extreme simplicity. Thus not one candidate in ten had tried to realise the picture in the third line, or reflected that 'picking a quarrel' was not an appropriate term for birds. At least ten per cent. did not know the English of *canards*, and the majority failed to render *empressés*. On the other hand, a fair proportion saw that in the last couplet it is almost imperative to render the French adjectives by substantives.

Honours

Some improvement in Honours.

"In spite of the fewer entries the number of passes is slightly higher than last year.

French Composition and Essay.

"The reviser of the first paper (French Composition and Essay) speaks in the highest terms of the candidates' performance. 'Most of the essays were quite interesting to read, and several exhibited, not only originality of thought, but real cleverness in handling the language.' The *thèmes* were likewise satisfactory, though often marred by gross blunders. The reviser of the second paper is likewise satisfied with the work as a whole, but qualifies his approval. In the first passage set, a critique of Shakespeare, the failures were due quite as much to an ignorance of English literature as of the French language. The passage of French verse was better done than the prose, and a fair proportion showed genuine appreciation of the poetry. *Humer* and *hâles* are words of rare occurrence that I did not expect to be known, but there is no excuse for ignorance of such words as *bruyère* and *preux*. From the alternative questions set as riders on the translation five-sixths chose the one on prosody. Comments on the neglect of this branch of French study passed in previous years had evidently been taken to heart by teachers, and the main rules of French scansion were correctly given by the greater number. There was, however, a painful uniformity in the answers, showing that they had been got up from the same text book; and in their classification of French rhymes most candidates fell into the logical error of cross division. The few who attempted the first alternative did not get beyond an analysis of the poem, interspersed with notes of admiration, and a comparison with Victor Hugo or Wordsworth was the rare exception. On the philological question only one candidate gained a high mark. Literary criticism belongs to a later stage than school, but lessons on *la vie des mots* are both attractive to school-boys and profitable."

The second paper.

GERMAN

It is much to be regretted that German can hardly be said to be holding its ground. At the same time it appears to be chiefly in the smaller schools that its popularity has diminished. The causes of the decline are obscure, but at least they are not peculiar to Scotland. Enquiry shows that in England the phenomenon is even more strikingly apparent. Whatever the ultimate explanation may be, it is not to be found in the way in which the subject is handled. The teachers who deal with it are almost all well qualified by continued study at home as well as by residence abroad. More modern methods of instruction are being gradually adopted everywhere; considerable progress has been made in the scientific treatment of pronunciation; and the oral facility of the pupils has improved. In a few of the best schools the pupils really work in a German atmosphere, and there the results are excellent.

Continued decline in study of German.

The Chief Examiner sums up his impressions of the written papers in the following terms:—

"Whilst the general impression left on me by the written work in the several grades, so far as it has come under my personal observation, hardly enables me to record any very decided advance in any of them, I can at least honestly say that I am by no means dissatisfied with the general results of this year's examination. There are doubtless still not a few schools, too many in fact, in which either too little time is given to German, or the methods of instruction are too little advanced, to admit of their making anything like a respectable figure in a test of this kind; still, upon the whole, the results seem to me to afford ample evidence of careful and efficient teaching in the Scottish schools.

General results satisfactory.

"The standard and general character of the papers will probably have been found much the same as those of last year, with the exception, perhaps, of the detached sentences in the Higher Grade paper, which were pitched somewhat higher than in former years. The result of this experiment, I must confess, has not been very encouraging, comparatively few of the candidates having come up to my expectations in their translation of these sentences. Whether, however, the discontinuance of the Honours Grade may not render a certain advance in this direction advisable, if not inevitable, remains to be seen. It scarcely requires to be stated that detached sentences such as those referred to serve a certain important object of their own; they are intended to test the candidate's power of idiomatically rendering common turns of speech such as the participial (or gerundial) constructions which form so prominent a feature of English prose style, and which, in connected translation, may often be avoided by a total change of construction. That an examination which is to test anything beyond a mere elementary knowledge of the German language is bound to take some account of such cardinal features of idiom can scarcely be doubted; and if, besides the ordinary purpose of a bare pass in a subject of general culture, the Higher Grade examination is to aim, as would seem desirable, at affording candidates an opportunity of showing a more thorough knowledge of the language, some questions of a more advanced nature will probably best serve that purpose.

Some weaknesses in the Higher Grade.

"The translations of the continuous passages were, on the whole, fairly well done both in the Lower and the Higher Grades; and still more so perhaps the free composition, except that not a few of the Higher Grade candidates went rather far astray from the given sketch, and often missed the real point of the anecdote. Nevertheless, both kinds of Free Composition seem to me admirably adapted for encouraging oral instruction.

Translation. Free Composition.

"As regards the results of the Honours Grade, there is this year no occasion for violating the time-honoured rule of '*de mortuis nil nisi bonum*';

Honours.

it certainly was very gratifying to me to see it make its exit with so satisfactory a record.

German Script.

"The German script seems to have been used by practically all the candidates—I certainly have not met with a single set of answers in which it was not employed. This surely is all the more satisfactory, as the quality of the writing, too, seemed to me, on the whole, to leave little to be desired."

SPANISH

Written papers unsatisfactory.

The seeds of interest in Spanish are very slow to fructify. The written papers sent in were, for the most part, exceedingly unsatisfactory in character. The Examiner reports that the translation into English was clumsy, and absurd renderings of simple Spanish words and idioms were common. The composition contained numerous grammatical errors, and betrayed the candidates' ignorance of Spanish constructions. Further, in the accentuation of the Spanish words great inaccuracy was shown. In brief, it was evident that the subject had not been treated in a sufficiently serious spirit, and consequently that the time devoted to it had been largely wasted. Whatever is done in school should be well done; if there is not time for doing a thing well, it should be left alone. It may be doubted whether the study of this language will make much headway in Scotland until its value for practical purposes becomes more generally appreciated.

GAELIC

Results highly satisfactory.

The success of the Gaelic portion of the Leaving Certificate Examination may now be regarded as well assured. The results this year are considered by the Chief Examiner to be highly satisfactory. The number of failures, it is true, is rather larger than on either of the two previous occasions. But that appears to be due to the fact that several candidates must have been encouraged to attempt the paper who were quite unfit to take it. As a matter of fact, the majority of those presented could have passed with credit an examination framed upon a considerably higher standard. The orthography continues to be the weak feature, but a perceptible improvement in this respect is noticeable this year. Dealing with this point, the Chief Examiner remarks:

"In many localities, notably in Lewis, where, upon the whole, the best work in other respects is found, a strong localism in pronouncing Gaelic is met with. Here, and also elsewhere, an apt word or a pure idiom or turn of phrase is written with fair regularity in a semi-phonetic form, but differing widely from the literary standard. It appears to me that this can be traced to the faulty training of the teacher, at least to some extent. Where such feature was found, the fault was less severely punished."

The following observations as to the districts from which the candidates were drawn are of considerable interest.

Distribution of candidates.

"The distribution of the candidates over the Gaelic-speaking area presents some anomalies. Lewis and Skye are well represented. Mainland Rossshire, mainland Inverness, and Sutherlandshire are represented by two parishes each. There is not a candidate from the western seaboard from Gairloch to Strontian. In the Isles there is not a candidate from Gigha, Colonsay, Mull, Iona, Coll, Eigg, Canna, Rum, or Barra."

MATHEMATICS

Improved methods.

To judge from the reports of the visiting Inspectors, the artificial barriers that have so long separated the various branches of Mathematics are gradually breaking down, and methods of instruction are becoming correspondingly broadened and more varied. As a rule, the qualifications of the teachers are thoroughly satisfactory, and adequate time is given to the subject. In the best of the schools—and it is most gratifying to find that some of the smaller are included—methods and results are excellent; in a few it is not easy to see how they could be improved. Here and there some confusion exists between the different members of the staff who are engaged in mathematical instruction. There should always be a perfect understanding as to the general guiding principles to be followed by all. This can only be secured by the assistance of a carefully devised scheme of study, showing exactly the work that should be overtaken by each class in every year of the whole course. In no case should Arithmetic, Algebra, and Geometry be taught to the same pupils by entirely different masters; there could hardly be a more certain way of defeating the fundamental aim of all recent reform. Some common weaknesses may be briefly alluded to.

Geometry.

While teachers and pupils appear to be fairly settling down to the study of Geometry on the newer lines, the connection between the experimental and the demonstrative sides of the subject is not maintained with sufficient closeness. Some teachers seem unwilling to recognise that there is any connection at all, or to understand the end and purpose of the practical exercises with reference to the teaching of theory. The whole work should centre round these practical studies; and, in the earlier stages at least, the teacher, freeing himself from the trammels of any particular text-book, should aim through them at the origination and development of geometrical ideas. After from four to six months of experimental enquiry the pupil should have acquired a sufficiently accurate knowledge of fundamental conceptions to enable him to begin to employ the demonstrative method; and the deductive method of dealing with a given question should follow the inductive as closely as possible in point of time.

Algebra.

Algebra is generally commenced on proper lines, and is often closely related to Arithmetic, but it is too seldom linked in any way with the geometrical truths that are studied simultaneously; this remark applies to the more advanced classes also, as was plain from much of the work in the written papers. Misunderstanding is frequent as to the point in the course of study at which graphs may be taken up with advantage. At present they are apt to come in too late for that fuller treatment which would give them a higher educational value. In this connection it is satisfactory to learn that there is now a more intelligent understanding of equations of all kinds by the pupils. The graph is generally, however, somewhat scrappy and unfinished; it is seldom left in a state in which one could refer to it for exact information. A fear has been expressed in several quarters that

Arithmetic. the study of Arithmetic may tend to fall into disuse after the attainment of the Intermediate Certificate. As a matter of fact, some branches of the subject, such as Stocks and Investments of various kinds, are of such a highly specialized character that they ought not to be forced upon the ordinary pupil. On the other hand, a short and thorough revision of the principal methods should be undertaken at the beginning of the secondary course; in particular, decimal fractions and the best ways of dealing with problems in proportion should be very carefully considered.

The written work. The Chief Examiner in Mathematics has furnished the following report upon the results of the written papers. As usual, it will be found to illustrate very aptly the criticisms of the visiting Inspectors:—

General remarks. "The results of this year's examination may be pronounced satisfactory as regards the mathematical papers. Taken all over, it is clear that the general character of the instruction given in the schools is intelligent and careful, and that the scholars give thought and attention to the subject. The most noteworthy point is the gradual improvement which goes on from year to year in the style in which the work is written out, and there can be no doubt that the improvement in style is accompanied by an improvement in the quality of the work. Of late years there has been special advance in the accuracy and neatness of the graphical work, which as a whole is distinctly creditable to the schools. It is also clear that the changes recently made in the examination syllabus have resulted in improved methods of teaching and a breaking down of the partition which formerly appeared to exist between theory and practice. There is of course still much to be done. In all the mathematical papers more use might be made of squared paper to facilitate the drawing of diagrams and calculations therefrom. There are still one or two schools where the detailed calculations are not written in their proper place as part of the answer, but are put down in an untidy mass at the side or bottom of the page with, as the consequence, inaccurate results and a loss of marks due to such neglect of the instructions."

Lower Grade

Work satisfactory. "I.—The standard of the paper was well suited to the attainments of the majority of the candidates. The average character of the work was quite up to the standard of previous years, while the number of papers containing really bad work was comparatively small. Drawings and measurements were generally neat and careful, but more use might have been made of the square-ruled paper.

Modern methods of teaching. Modern methods of teaching have clearly been largely employed, with, in general, satisfactory results. In some cases, however, candidates were inclined to dispense with geometrical proofs, apparently supposing that a result, tested by measurement in one case, was a sufficient proof that the same result held good in all similar cases. Many appeared not to understand that the second part of a geometrical question can in most cases be solved by a simple application of the theorem proved in the first part, and even when told to *deduce* a certain result, many candidates attempted an independent proof of that result.

Work good. "II.—As a whole, the work was good, showing a grasp of the elementary algebraic processes, and also neatness and accuracy in applying them to examples. Instruction in the method of representing equations graphically appears now to be universally given with very gratifying results. Comparatively few, however, were able to form the equation corresponding to a given straight line. The solution of quadratic equations by means of factors, where that method is applicable, is well understood.

Some weaknesses. Unfortunately in some schools beginners are still encouraged to attempt solution by formula, although this method depends on memory rather than intelligence, and, at this stage, leads nearly always to failure. Problems leading to

equations, and one involving the use of algebraical symbols in arithmetical calculations, were only occasionally well done.

"III.—In this paper many candidates gained a high percentage of the maximum marks, and the work was, as a rule, written out in good style. The metric system seemed well understood as regards its application to length and weight, but few are able to apply it to square and cubic measure, in spite of the simplicity of the calculations. Thus many who can write down that 1728 cubic inches make one cubic foot, are quite unable to discover how many cubic centimetres there are in a cubic metre. In some schools scholars do not understand what is meant by a 'prime number,' in some they are unable to write down an answer correct to the nearest unit.

Work, as a rule, good.

Metric system.

Higher Grade

"I.—The work in this paper was very fair, and showed progressive improvement on former years as regards writing, arrangement, and diagrams. More care should, however, be given to the writing of the letters which represent points in the figures, as in many cases examiners have difficulty in knowing which of two or more similarly formed letters is intended. In some cases figures were drawn too small, and full use was not made of the square-ruled paper. Some candidates had, apparently, not yet been provided with decimally-divided scales as required by the instructions. In many cases the value of a well-drawn figure was greatly diminished by failure to specify the steps taken in its construction. Some candidates appeared to think that a well-drawn figure served all the purposes of a geometrical proof.

Improvement on former years.

Some weaknesses.

"II.—The answers were generally written out neatly and carefully, while the graphic work deserves special praise. Many candidates, however, disregarding the instructions, unnecessarily adopted different units for vertical and horizontal measurements. The rule as to the number of questions to be answered was far better followed than in former years. The work was generally satisfactory, but the first question, which was purely arithmetical, was not well answered, very few candidates perceiving that the best method of treatment was the reduction of each fraction to a decimal before attempting to add them together.

Excellence of graphic work.

Work, as a whole, satisfactory.

"III.—As a whole, the work in this paper was satisfactory, both in style and in grasp of principle, giving evidence of careful preparation and of such familiarity with the use of instruments and mathematical tables as proved that the training had been sound and practical. One weak point, however, was the definition of a cosine, often given without a figure, and without any explanation of the convention regarding the signs of lines necessary for the case when the angle is greater than the right angle. Diagrams were generally excellent, although sometimes on too small a scale, but were often unaccompanied by a proper statement of the steps of the construction, which is, of course, as necessary in trigonometry as it is in geometry. Many candidates did not understand the meaning of finding a result correct to a certain number of decimal figures, or the relation between four place values and five place values of the same quantities.

Work satisfactory.

A weak point.

Diagrams.

Honours

"*Geometry.*—The work may be said to have reached a fair standard. Most candidates evinced an excellent grasp of the properties of the nine points circle and the radical axis, but some weakness was shown regarding similar figures and inversion. In some cases proofs were unsuccessful through weakness in elementary geometry. Although the majority of the diagrams were careful and accurate, yet some candidates drew very inaccurate figures, and were, in consequence, led astray. A serious fault, which occasionally presented itself, was the statement that the results had been proved, when this was not the case. Other candidates, instead of proving them, stated that they could easily be proved. Some weakness was shown as to knowledge of the meaning of the mathematical terms employed in the questions.

Work fair.

Some faults.

"*Algebra.*—The questions on the binomial theorem, on the identity of logarithmic series and on the products of binomial expressions involving squares, were generally well answered, but a good deal of weakness was

Some weaknesses.

shown in algebraical simplifications and in the explanation and interpretation of complex numbers. Some of the questions were seldom attempted successfully. In the case of some candidates there was evidence that advanced work had been learned without being properly understood by those who were not sufficiently familiar with elementary principles.

Work satisfactory.

"*Trigonometry and Logarithms.*—The quality of the work was generally satisfactory, and most of the candidates showed that they had received

Graphs.

good and careful preparation up to the required standard. The graphs, however, were seldom plotted with sufficient accuracy. There was also, as so often happens in this subject, an unfortunate tendency to manipulate the work so as to make it appear as if a known result had been properly obtained, although such mistakes had been made that the candidate must have known this was not the case. The dishonourable nature of such artifices should be impressed on all candidates.

ADDITIONAL SUBJECTS

Distinct improvement.

"*Elements of Dynamics.*—The work in this subject shows distinct improvement, the proportion of unprepared candidates being much smaller than used to be the case. Weakness was, however, apparent in the explanation of relative velocity and the enunciation of the parallelogram of forces. On the other hand, examples involving these ideas were often correctly worked out, and questions on hydrostatics were well answered. A beginning has been made in graphic work, but candidates require to be trained to draw their diagrams on a larger scale and to state on their diagrams the units adopted for both vertical and horizontal measurements.

Work satisfactory.

"*Geometrical Conics.*—The candidates showed satisfactory knowledge of bookwork and power of solving riders. The diagrams were generally good, and in some cases excellent. The chief fault was the tendency to write down steps of the proofs without giving any clue to the basis on which each assumption rested.

Work very good.

"*Analytical Geometry.*—In one or two schools the work appeared to indicate undue rapidity of instruction, but in most cases it was very good, and the diagrams often deserved high praise. In some cases they were even unnecessarily elaborate, but, as in other subjects, their value was frequently marred by the omission of a proper statement of the steps taken in their construction.

Work not quite satisfactory.

"*Higher Dynamics.*—On the whole the candidates were hardly up to the level of this paper, although some did well in answering the question on projectiles and that on Boyle's law. The proof of the theorem on uniform circular motion was generally given with the help of the hodograph, but it was not always clear that the candidates understood what a hodograph is. More attention should apparently be given to graphical methods in statical problems."

SCIENCE

Progress satisfactory.

Instruction in Experimental Science continues to make headway steadily. Our Inspectors report that progress is generally satisfactory, and that a good spirit pervades the instruction. A defect at which I hinted last year has recently been brought into more decided prominence in connection with the consideration of the various Intermediate Curricula submitted to us for approval. The schemes of study proposed often show a

Too much attempted in schemes of study.

tendency to attempt a larger volume of work than could be overtaken satisfactorily in the time allotted to the subject. This is a fault which, as I said a year ago, experience may be trusted to remedy. In many schools fairly satisfactory courses have been evolved in the earlier stages of Physics and Chemistry, but the more advanced stages of these subjects are more difficult to treat along inductive lines, and the difficulty

to be overcome is still greater in dealing with the subjects that may be described as organic. While teaching is usually effective, care must continue to be taken in some quarters to prevent the laboratory operations of the pupils becoming a series of isolated experiments instead of consecutive studies, properly cemented together by frequent discussion of principles. One of our Inspectors lays stress on the marked improvement that has been effected lately in the note-books of the pupils. He adds—

"It is of real consequence to the general education of the boys and girls that their notes should be written as well as if the lesson were one in Writing, the composition as closely studied as if in an ordinary English class, the calculations set forth in the same good shape as is required by the teacher of Mathematics, and the diagrams of apparatus and plant dissections drawn as if done under the eye of the Art Master."

Connection between Science Instruction and other subjects.

The close interconnection that ought to subsist between the Mathematical and the Science Instruction is being fairly well maintained. Its importance cannot be too strongly insisted upon. It is also worth while pointing out that in schools where workshops have been established and where Manual Instruction is given to the pupils, a very effective correlation between Science and Manual Work is possible. In a number of cases this has been established, and boys have constructed pieces of apparatus in the workshop which they have afterwards used in connection with their experimental work in the Science laboratory. Further developments in this direction might well be encouraged. Again, in the laboratory pupils should endeavour to get out of their instruments the utmost accuracy of which each instrument admits. From the very beginning the idea of fractional error should be firmly grasped; the probable fractional error should be estimated before the experiment begins.

Increase in presentations for Intermediate and Leaving Certificates.

The Chief Examiner reports a very large increase in the number of candidates presented at the examination for Intermediate and Leaving Certificates. This is largely due to the working of the new regulations, under which all pupils are normally put forward for approval of their work at the end of the third year of their Intermediate Course. The quality of these candidates was found to vary considerably; but on the whole it was satisfactory, and no doubt it will improve as the teachers gain fresh knowledge of sound methods. The work of those pupils who appeared for examination on the higher standard was again good. And it is exceedingly satisfactory to know that in more than fifty per cent. of the schools the examiners were able to accept the teacher's list without change or modification of any kind. This is a sure sign of the growth of that mutual confidence which is essential to any really healthy system of examination.

DRAWING

The valuable report by the Chief Examiner in Drawing, which I printed *verbatim* a year ago, renders it unnecessary to refer again in detail to the general principles by which the teaching of the subject should be regulated. All the more is this the case

Memorandum on Drawing.

in view of the recently published Memorandum, which may be expected to find its way into the hands of all who are interested.

Equipment in Schools.

It appears that in many of the better Higher Grade and Secondary Schools, the Drawing Instruction is now carried on in commodious and well-equipped Art-rooms, furnished with convenient, easily-moved, single desks, well-provided with carefully selected objects of good form and colour suitable for harmonious arrangement and representation, and possessing in addition abundant facilities for growing and obtaining examples for Nature Study and Drawing. But in not a few of the smaller schools, and even in some of the larger ones, the position of affairs is much less satisfactory. In some cases the attention of Managers has been specifically drawn to obvious deficiencies, while it is to be hoped that in others due note will be made of this general warning.

Increased presentations

As in Science, so in Drawing, the number of presentations at the annual Examination was very largely augmented owing to the operation of the new regulations regarding the Intermediate Certificate. After allowing for this change, the Chief Examiner is of opinion that the work done by the candidates more than holds its own in quality, purpose and amount, when compared with the output of any former year. At this Examination the actual test is not allowed to bulk very largely in determining the merits of the pupils' work. But it affords a useful opportunity for seeing how they attack a definite problem, for suggesting and illustrating improved methods of working, and for indicating fresh avenues of study. The real basis of the award is the character of each pupil's work throughout his course. The Department is in cordial agreement with one of our most experienced Examiners in Drawing, who thus describes the ideal which he endeavours to keep before him:

"The examination day should be the opportunity for intercourse, for encouragement, for sympathy, and for approbation. And the more the teacher is made to feel his co-judgeship, the more he is got to realise his share in the judgment and the weight his verdict has with the examiners; in other words, the more he is made to believe that his finding is the finding of the court, the better it will be for his work individually and for the general health and progress of the subject. Faults should be dealt with generously, virtues made the most of, narrowed visions enlarged, and good hints gathered in the course of the work should be imparted by the Inspectors when it seems desirable that this should be done."

Institution of a pass on higher standard.

I have only to add that a development of considerable importance is in view for the immediate future. The type of work and the standard of attainment necessary for what has hitherto been known as "a pass in Drawing for the Leaving Certificate" are now fairly definite and well understood. Beyond this stage the instruction has naturally been conducted on somewhat less clearly marked lines. Candidates have been presented for "endorsement," sometimes after two years of additional tuition, sometimes after less than one, and on the strength of programmes of work varying greatly both in kind and in amount. The moment would seem to have come for the institution of a pass in Drawing on the higher standard. This will be open to

pupils, who, after gaining the Intermediate Certificate, have gone through a properly mapped out and approved course extending over two years beyond the Intermediate stage. Proposals are now invited from schools for consideration. We shall be quite prepared to sanction individual schemes that vary considerably from one another in matters of detail, but it will be expected that a unity of æsthetic purpose shall pervade them all, and that a reasonably high level of achievement is contemplated throughout.

COMMERCIAL SUBJECTS

Commercial French

Results again disappointing.

It has already been indicated that the study of specially Commercial Subjects is on anything but a satisfactory footing in our schools. This year there were no candidates in Commercial German. A few, however—chiefly aspirants for the Commercial Certificate—took the paper in Commercial French. It was not well done. The translation into English, both of the letter and of the market-report, was rather better than in previous years, a more idiomatic English rendering of the French commercial terms being given. On the other hand, the letter written in French was defective; in addition to numerous grammatical errors, the expressions used by several of the candidates were altogether inappropriate to the letter in question—"We take the liberty of writing you," "Thanking you in advance," etc., etc. It is particularly worthy of notice that none of the candidates were able to give the meaning of the ordinary English commercial terms they were asked to explain.

Book-keeping and Commercial Arithmetic

New condition as to presentation for Examination.

The new condition as to presentation which came into force this year has naturally had a considerable effect in reducing the number of candidates. No pupil may now take these papers unless he has already obtained the Intermediate Certificate, or has at all events secured a pass in Lower Grade Mathematics.

Level of attainment rising.

As might be expected, the average level of attainment shows a marked tendency to rise. The Examiner in Book-keeping reports in the following terms:—

"This year's examination paper was framed so as to test knowledge of the various steps of Book-keeping independently of each other. The results were on the whole fair. The entries in the Cash Book were well made; the easy parts of the Profit and Loss Account and of the Balance Sheet were well done; but considerable weakness was shown in dealing with a purchaser's capital and in answering the question on outstanding discounts. There was often a lack of ingenuity both in the manner of working out the answers and in the statement of them. The style was somewhat disappointing, entries not being so neat and clear as they should have been. Writing and ruling were not more than fair."

Note for 1908.

It should be noted that in 1908 candidates may be required to do their own ruling in the Book-keeping paper.

As regards Commercial Arithmetic the Examiner says:—

Fair work in first paper.

"In the first paper the work was of fair quality, good answers being generally given to questions involving mental calculation, including those

which required a knowledge of the metric system ; on the other hand there were often mistakes in the simple addition of money columns. In the second paper the candidates showed a good grasp of the principles of the subject, mistakes being due less to ignorance of arithmetic than to careless calculation or a misunderstanding of the meaning of the question. Thus in finding the cost of a Bill of Exchange on Berlin, several candidates only worked out the sum to be paid for stamps and commission and omitted the value of the sum which had to be transmitted. On the other hand a question on the relative dearness of goods at a franc per metre in France and 8d. a yard in England was well answered by means of a very considerable variety of methods."

Good work in second paper.

PHYSICAL TRAINING

Value of school games and sports.

In Secondary Schools generally the pupils receive a considerable part of their physical education in the form of school games and sports. If properly supervised and arranged, such training may be very valuable. But care must be taken to prevent undue exertion, especially in the case of girls. From a report received from our Inspector of Physical Training, I gather that this warning is by no means unneeded. The same report supplies a mass of useful information with regard to the present position of this important subject in Scotland. The difficulties in the way are great. Not the least of them is due to the present unsettled state of expert opinion as to the relative merits of rival systems. But one or two points stand out conspicuously. As yet the true aims of Physical Education have not been sufficiently considered. Except in those schools which have secured the services of specially trained instructors, the absence of any scheme to cover the whole school course, and to meet the varying requirements of classes of all ages, is very noticeable. Few Headmasters realise that any school system of Physical Training must be looked upon as largely corrective, and that it should be expected to have a powerful and beneficial effect on the pupils' mental activity, alertness, and capacity for concentration. It falls to be noted that, as a rule, the schools where the most systematic and successful action has been taken, are schools for girls. Let me append a few sentences from the Inspector's report.

A warning.

Aims of Physical Training.

"It is important for school purposes to remember that the mere formation of muscle does not necessarily secure good health and fitness, but may have rather the opposite effect, especially during the years of most rapid growth in mind and body, that is, between the ages of twelve and eighteen, which most secondary school courses cover. In the aimless development of masses of muscle many young people have permanently injured their health and have little power of endurance or of resisting fatigue. Heavy dumb-bell work and exercises on apparatus, requiring great effort and strain, cannot be good for the younger classes. It is now generally admitted that very heavy gymnastic work has a deadening effect on the mind."

Reference to Tables.

In accordance with the usual custom, Statistical Tables are appended to this Report, providing a concise view of the manner in which the various funds available for the support of Higher Education have been administered during the past year.

In 1908 the Written Examination will commence on Tuesday, April 7th, when certain changes will also be introduced in the arrangement of the printed papers. Due intimation of these has already been given. It may be well to add that, in determining the results, special allowance will be made for the fact that the normal interval will not have elapsed since the examination of 1907.

Change in date of Examination

Special allowance to be made.

In conclusion, I should like to say that the question of instituting an Examination in Music is now under consideration. No definite steps will be taken until school authorities have been consulted as to the feasibility of the proposal. In the event of its being proceeded with, the precedent established in the case of Science and Drawing will be carefully followed. The schools will submit curricula for approval, and the main element determining success or failure will be the character of the work performed by the pupils during the whole period of instruction.

Proposal to institute Examination in Music.

I have the honour to be, &c.,

J. STRUTHERS

To the Right Honourable
The Lords of the Committee of Council
on Education in Scotland.

TABLES.

1905-

Statements of Income, Expenditure, and Liabilities of Secondary Schools sharing in School

INC

No.	NAME OF SCHOOL. (*Under the Management of School Boards.*)	Balance (if in hand).	Contributions payable from Common Good of Burgh or other Funds administered by Town Council.	Endowments.	School Fees and Books Sold.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Aberdeen Girls' High School	—	84 8 4	—	2,918 2 4
2	Aberdeen Grammar School	—	419 15 10	164 0 0	2,314 13 1
3	Arbroath High School	—	75 0 0	290 0 0	790 4 7
4	Ayr Academy	—	95 0 0	72 17 4	2,073 9 2
5	Brechin High School	85 10 10	30 0 0	—	383 16 8
6	Callander, McLaren High School	—	—	400 0 0	—
7	Dumfries Academy	—	140 0 0	119 18 5	1,863 15 3
8	Dunfermline High School	745 19 5	130 16 8	—	1,073 10 6
9	Duns, Berwickshire High School	72 9 4	—	—	232 14 5
10	Edinburgh, Royal High School	—	674 5 1	17 12 6	2,065 16 8
11	Elgin Academy	182 17 5	130 12 6	25 4 3	415 12 7
12	Falkirk High School	207 6 7	—	100 0 0	339 17 1
13	Forfar Academy	94 17 11	200 0 0	169 17 10	267 12 6
14	Galashiels Academy	88 9 3	—	—	281 5 4
15	Glasgow High School	—	570 0 0	—	5,705 4 6
16	Glasgow High School for Girls	—	—	—	4,887 9 10
17	Govan, Hillhead School	—	—	—	782 9 5
18	Greenock Academy	687 18 7	145 0 0	43 8 4	2,193 11 6
19	Haddington, Knox Institute	30 0 9	42 15 0	80 0 0	440 3 3
20	Hamilton Academy	107 18 9	—	—	1,310 19 4
21	Irvine Royal Academy	36 10 1	115 0 0	—	1,295 13 7
22	Kelso High School	—	—	—	410 5 6
23	Kirkcaldy High School	385 9 5	114 0 0	215 13 0	684 15 11
24	Kirkcudbright Academy	—	224 9 2	200 0 0	240 11 9
25	Linlithgow Academy	6 12 2	—	54 7 8	343 18 3
26	Montrose Academy	117 0 2	180 0 0	67 5 6	962 2 0
27	North Berwick High School	52 4 2	—	—	110 15 0
28	Paisley Grammar School	1,605 9 3	60 0 0	49 17 6	1,710 0 8
29	Peebles High School	5 12 7	100 0 0	—	171 0 2
30	Perth Academy	—	271 14 0	151 12 6	2,504 12 2
31	Stirling High School	963 2 10	226 17 4	483 15 4	1,832 12 2
32	Stranraer High School	*307 8 2	145 0 0	—	379 8 9
	Carried forward . .	5,782 17 8	4,174 13 11	2,705 10 2	40,986 3 11

* The balance in the previous return was incorrectly given by Managers as £307 9*s.* 0*d.*

1906.

the Grant under the Minute of 27th April, 1899, in respect of the last Financial or Year.

OME.

Grants from Committees of Burghs and Counties for Secondary Education under § 2 (1)(b) of Education & Local Taxation Account (Scotland) Act, 1892.	Grants from Scotch Education Department under Minute of 27th April, 1899.	Grants from Scotch Education Department for Science and Art.	Payments out of the School Fund.	Loan raised for Enlargement of School.	Interest on Bank Deposits.	Other Sources of Income.	Total Income.	No
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
500 0 0	*1,500 0 0	220 15 4	1,735 8 6	550 0 0	—	508 8 0	8,017 2 6	1
500 0 0	*1,500 0 0	384 11 4	2,686 17 8	6,500 0 0	—	84 7 3	14,554 5 2	2
250 0 0	*1,500 0 0	321 12 3	705 6 3	—	—	—	3,932 3 1	3
692 9 0	*1,400 0 0	—	984 16 4	—	—	224 15 4	5,543 7 2	4
250 0 0	*1,100 0 0	151 6 3	380 0 0	—	—	40 0 0	2,420 13 9	5
141 8 3	*750 0 0	113 16 6	124 11 8	—	- 9 3	—	1,530 5 8	
1,169 1 4	*1,500 0 0	226 0 3	814 7 10	—	—	15 7 6	5,848 10 7	7
360 0 0	*1,400 0 0	756 9 8	100 0 0	—	—	112 13 6	4,679 9 9	8
900 0 0	*750 0 0	102 14 0	—	—	—	10 3 8	2,068 1 5	9
850 0 0	600 0 0	48 8 3	3,566 14 3	—	—	—	7,822 16 9	10
285 0 0	*1,250 0 0	125 9 1	435 0 3	—	- 6 2	6 17 6	2,856 19 9	11
50 0 0	750 0 0	433 15 4	1,065 3 3	—	—	3 13 5	2,949 15 8	12
250 0 0	500 0 0	458 7 9	136 17 8	—	2 8 11	—	2,130 2 7	13
225 16 0	*750 0 0	—	103 14 0	—	—	1 8 6	1,450 13 1	14
1,600 0 0	750 0 0	77 11 0	4,443 18 10	—	—	2 16 3	13,149 10 7	15
880 0 0	600 0 0	16 7 6	2,810 7 2	—	—	50 0 0	9,244 4 6	16
641 15 0	*1,450 0 0	61 3 6	1,119 11 3	—	—	—	4,054 19 2	17
650 0 0	*1,250 0 0	303 17 2	980 0 0	—	—	—	6,253 15 7	18
100 0 0	*800 0 0	96 7 11	235 18 8	—	—	16 10 0	1,341 15 7	19
650 0 0	750 0 0	503 0 6	571 1 10	—	—	100 0 0	3,993 0 5	20
246 16 11	1,500 0 0	425 16 2	734 6 9	—	8 9 7	—	4,362 13 1	21
524 15 4	*750 0 0	11 3 9	92 15 4	—	—	1 4 3	1,790 4 2	22
299 16 3	*1,150 0 0	202 7 8	564 4 6	—	4 17 8	‡3,295 1 6	6,916 5 11	23
260 0 0	350 0 0	98 14 7	63 9 4	—	—	—	1,437 4 10	24
387 14 8	550 0 0	200 19 10	436 15 3	—	—	55 16 2	2,036 4 0	25
270 0 0	750 0 0	650 6 0	667 15 10	1,250 0 0	—	189 0 0	5,103 9 6	26
272 11 6	*750 0 0	138 17 9	391 11 7	—	—	—	1,716 0 0	27
—	*1,500 0 0	521 10 7	1,605 12 11	—	47 7 11	—	7,099 18 10	28
499 5 8	400 0 0	167 18 0	336 7 1	—	4 8 4	5 13 10	1,690 5 8	29
455 0 0	750 0 0	941 11 9	1,177 0 1	—	—	188 3 0	6,439 13 6	30
50 0 0	*1,500 0 0	664 3 2	474 17 5	—	14 17 2	314 15 5	6,525 0 10	31
215 0 0	*750 0 0	74 8 0	†180 0 0	—	—	—	2,051 4 11	32
14,426 9 11	31,550 0 0	8,499 10 10	29,774 11 6	8,300 0 0	83 5 0	5,226 15 1	151,509 18 0	

* These sums represent grants in respect of two years.
† This sum represents contributions from six parishes.
‡ Includes £3,223 9s. 6d. received from Insurance Company for damage caused by fire at High School.

No.	NAME OF SCHOOL. (*Under the Management of Authorities other than School Boards.*)	INCOME: Balance (if in hand).	Contributions payable from Common Good of Burgh or other Funds administered by Town Council.	Endowments.	School Fees and Books Sold.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
33	Aberdeen, Robert Gordon's College ..	—	—	27 9 11	4,096 17 3
34	Anstruther, Waid Academy	132 18 11	—	310 5 5	294 14 6
35	Beith, Spier's School	394 6 8	—	1,104 15 10	405 6 0
36	Crieff, Morrison's Academy	*430 8 9	—	1,177 5 4	1,379 0 0
37	Cupar, Bell Baxter School	†129 10 0	—	491 12 8	651 9 6
38	Dollar Institution	—	—	1,529 0 4	1,867 12 6
39	Dundee High School	—	500 0 0	1,192 11 2	3,175 19 4
40	Edinburgh, Daniel Stewart's College ..	—	—	3,939 14 11	2,837 1 0
41	Edinburgh, George Watson's Boys' College	—	—	6,368 3 4	8,064 10 0
42	Edinburgh, George Watson's Ladies' College	—	—	3,965 18 11	7,047 13 9
43	Edinburgh Ladies' College	—	—	4,241 17 2	7,645 10 9
44	Glasgow, Allan Glen's School	500 3 11	—	850 0 0	2,209 1 0
45	Glasgow, Hutchesons' Boys' Grammar School	—	—	3,546 6 9	502 19 6
46	Glasgow, Hutchesons' Girls' Grammar School	3,129 18 9	—	3,546 6 10	1,040 7 3
47	Glasgow, St. Aloysius College	—	—	—	693 14 4
48	Inverness Royal Academy	—	—	729 0 1	1,215 16 6
49	Nairn, Rose's Academical Institution ..	121 2 11	—	66 2 7	177 7 8
50	Newton Stewart, Douglas and Ewart High Schools.	—	125 0 0	708 8 10	378 7 5
51	Perth, Sharp's Institution	—	50 0 0	502 19 0	447 0 0
52	St. Andrews Madras College	—	—	791 5 4	1,000 5 9
53	Selkirk High School	‡185 3 2	—	191 10 9	90 14 0
54	Stonehaven, Mackie Academy	750 10 8	—	245 9 5	580 14 3
55	Tain Royal Academy	719 1 11	25 0 0	331 11 1	360 10 10
	Total -	6,493 5 8	700 0 0	35,857 15 8	46,162 13 1
	Brought forward from previous page ..	5,782 17 8	4,174 13 11	2,705 10 2	40,986 3 11
	GRAND TOTAL	12,276 3 4	4,874 13 11	38,563 5 10	87,148 17 0

* This includes £400 from Building Fund Account.
† This includes £29 3*s.* 4*d.* in respect of Continuation Classes.
‡ This includes £31 5*s.* 11*d.* from Building Fund Account.

OME.

Grants from Committees of Burghs and Counties for Secondary Education under § 2 (1)(b) of Education & Local Taxation Account (Scotland) Act, 1892.	Grants from Scotch Education Department, under Minute of 27th April, 1899.	Grants from Scotch Education Department for Science and Art.	Payments out of the School Fund.	Loan raised for Enlargement of School.	Interest on Bank Deposits.	Other Sources of Income.	Total Income.	No.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
500 0 0	750 0 0	2,275 0 0	—	—	—	—	7,649 7 2	33
260 0 0	350 0 0	164 9 8	—	—	2 16 4	—	1,515 4 10	34
60 0 0	350 0 0	—	—	—	—	—	2,314 8 6	35
274 0 0	450 0 0	—	—	—	—	—	3,719 14 1	36
260 0 0	350 0 0	119 1 9	—	—	4 14 0	73 0 0	2,079 7 11	37
145 0	750 0 0	743 17 1	—	—	—	208 11 6	5,244 1 5	38
947 7 0	750 0 0	497 19 11	—	—	1 11 3	298 19 9	7,364 8 5	39
200 0 0	600 0 0	—	—	—	—	—	7,576 15 11	40
200 0 0	750 0 0	246 14 9	—	—	—	—	15,629 8 1	41
350 0 0	750 0 0	98 19 10	—	—	—	—	12,212 12 6	42
650 0 0	750 0 0	143 8 4	—	—	—	—	13,430 16 3	43
600 0 0	750 0 0	2,679 2 5	—	—	—	28 0 0	7,616 7 4	44
300 0 0	550 0 0	—	—	—	16 13 3	—	4,915 19 6	45
300 0 0	650 0 0	—	—	—	16 13 3	—	8,683 6 1	46
329 2 6	400 0 0	147 0 6	—	—	—	534 11 3	2,104 8 7	47
—	500 0 0	257 18 10	—	—	—	—	2,702 15 5	48
—	350 0 0	31 6 6	—	—	—	255 5 3	1,001 4 11	49
190 0 0	450 0 0	226 16 5	—	—	—	—	2,078 12 8	50
253 0 0	450 0 0	662 10 10	—	—	—	—	2,365 9 10	51
260 0 0	400 0 0	118 9 10	—	—	—	—	2,570 0 11	52
113 2 8	350 0 0	111 11 6	—	—	—	1 6 0	1,043 8 1	53
360 0 0	400 0 0	212 0 9	—	—	15 7 10	36 17 0	2,600 19 11	54
115 0 0	400 0 0	171 14 7	—	—	—	—	2,122 18 5	55
6,666 12 2	12,250 0 0	8,908 3 6	—	—	57 15 11	1,436 10 9	118,532 16 9	
14,426 9 11	31,550 0 0	8,499 10 10	29,774 11 6	8,300 0 0	83 5 0	5,226 15 1	151,509 18 0	
21,093 2 1	43,800 0 0	17,407 14 4	29,774 11 6	8,300 0 0	141 0 11	6,663 5 10	270,042 14 9	

TABLE I.

No.	NAME OF SCHOOL. (*Under the Management of School Boards.*)	Balance (if overdrawn).	Salaries of Teachers.	Enlargement of School Buildings.	EXPENDITURE: Books, Apparatus and Stationery.	Fuel, Light and Cleaning.	Replacement of Furniture, and Repairs to Buildings and Furniture.	Interest on Loans.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Aberdeen Girls' High School	979 19 6	4,402 10 0	184 19 3	100 16 8	486 12 5	158 7 4	722 12 4
2	Aberdeen Grammar School ..	2,039 5 8	5,091 10 9	5,321 7 4	184 6 1	319 6 8	273 8 4	336 10 1
3	Arbroath High School ..	349 17 2	1,912 17 8	—	61 10 7	95 18 4	12 3 6	319 15 0
4	Ayr Academy	646 17 11	3,328 9 6	—	184 9 6	134 18 11	460 14 1	141 3 0
5	Brechin High School ..	—	1,361 5 0	—	90 3 11	48 0 6	155 18 0	97 2 10
6	Callander, McLaren High School	52 7 10	697. 5 10	20 0 0	37 5 0	45 4 1	22 15 5	62 13 9
7	Dumfries Academy ..	809 5 9	3,518 0 11	—	66 14 6	172 13 4	105 18 10	458 7 10
8	Dunfermline High School ..	—	2,440 6 4	—	220 10 11	412 12 11	63 15 3	—
9	Duns, Berwickshire High School	—	1,037 9 8	—	118 10 3	68 16 7	55 3 0	—
10	Edinburgh Royal High School	—	5,878 0 3	—	110 10 10	264 12 9	179 1 11	233 4 11
11	Elgin Academy	—	1,450 17 0	—	58 8 9	93 18 1	33 3 7	145 1 5
12	Falkirk High School ..	—	2,026 16 0	—	111 15 2	126 12 2	57 16 9	413 11 10
13	Forfar Academy	—	1,343 17 3	—	49 15 1	75 6 4	29 19 11	46 17 9
14	Galashiels Academy ..	—	761 14 8	—	40 10 4	32 16 1	13 2 3	5 3 6
15	Glasgow High School ..	—	9,018 14 8	—	152 5 2	461 18 9	544 0 2	1,120 7 0
16	Glasgow High School for Girls	—	6,053 8 8	—	96 4 8	392 11 8	748 12 3	783 16 0
17	Govan, Hillhead School ..	—	2,976 13 0	360 0 0	72 12 2	88 0 0	40 0 0	147 0 0
18	Greenock Academy ..	—	3,504 18 3	—	92 13 4	166 2 11	104 1 1	202 0 10
19	Haddington, Knox Institute	—	973 6 8	—	90 17 1	94 2 0	136 7 6	68 13 6
20	Hamilton Academy ..	—	3,186 2 5	—	149 13 2	316 6 7	18 0 6	17 15 10
21	Irvine Royal Academy ..	—	1,940 0 0	—	64 1 9	104 17 2	241 18 6	456 3 9
22	Kelso High School .	71 19 4	1,287 19 11	—	42 10 7	55 14 6	19 6 11	38 9 4
23	Kirkcaldy High School ..	—	1,814 10 5	*1,263 1 6	195 9 8	291 11 3	130 9 0	—
24	Kirkcudbright Academy ..	—	1,195 18 5	—	24 8 2	37 3 7	13 14 10	51 17 5
25	Linlithgow Academy ..	—	1,218 11 2	7 0 0	127 14 8	125 7 4	11 18 8	245 9 2
26	Montrose Academy ..	—	2,397 14 8	1,238 2 1	321 10 11	173 17 10	191 14 3	200 13 2
27	North Berwick High School	—	743 13 3	9 6 3	15 4 4	53 4 3	27 9 2	120 10 8
28	Paisley Grammar School ..	—	3,755 0 4	382 1 5	55 19 6	375 6 10	100 19 9	456 5 5
29	Peebles High School ..	—	1,141 8 4	—	30 17 5	155 3 11	10 9 9	153 17 3
30	Perth Academy	1,426 10 11	4,331 14 7	—	200 8 5	278 11 11	235 8 3	234 8 6
31	Stirling High School ..	—	3,522 1 9	—	162 1 6	249 4 4	209 19 5	105 2 6
32	Stranraer High School ..	—	1,027 19 8	—	87 13 4	39 11 4	17 9 5	—
	Carried forward ..	6,376 4 1	85,370 16 10	8,785 17 10	3,417 13 5	5,836 5 4	4,423 7 7	7,384 14 7

* For reconstruction of School Buildings damaged by fire.

—*Continued.*

ITURE.						BALANCE.				
Repayment of Loans.	Rent, Rates, Taxes and Insurance.	Expenses incident to Annual Examination.	Printing, Postages, Advertising, etc.	Other Expenses.	TOTAL EXPENDITURE.	If in hand.	If overdrawn.	Total assessment in the £ for School Rate.	Product of a Rate of 1d. in the £.	No.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£	
494 10 0	178 7 1	1 10 0	59 7 6	112 0 9	7,881 12 10	135 9 8	—	1 5	3,094	1
320 2 2	170 2 2	6 15 8	42 6 6	132 4 8	14,243 6 1	310 19 1	—			2
357 16 3	132 15 0	15 11 6	26 6 5	169 2 11	3,453 14 4	478 8 9	—	1 1$\frac{1}{16}$	322	3
247 1 8	119 7 10	35 5 6	40 19 7	277 11 7	5,616 19 1	—	73 11 11	10$\frac{7}{8}$	619	4
93 0 0	28 10 0	7 4 10	5 12 0	4 3 0	1,891 0 1	529 13 8	—	1 1	123	5
61 17 11	41 18 7	—	9 11 3	32 10 8	1,083 10 4	446 15 4	—	8	80	6
356 0 0	80 3 10	11 0 6	45 13 10	157 16 10	5,781 16 2	66 14 5	—	1 2	240	7
—	70 8 10	4 18 0	31 9 9	61 0 0	3,305 2 0	1,374 7 9	—	1 3	302	8
—	24 16 10	- 10 0	20 9 4	247 1 8	1,602 17 4	465 4 1	—	6$\frac{1}{4}$	86	9
380 17 2	292 13 6	2 4 0	88 8 11	393 2 6	7,822 16 9	—	—	11$\frac{1}{4}$	11,120	10
167 8 9	101 6 2	—	11 7 2	25 4 3	2,086 15 2	770 4 7	—	1 1	137	11
298 18 0	102 9 11	- 10 0	16 11 7	17 1 1	3,172 2 6	—	222 6 10	1 11	382	12
110 0 0	12 3 11	2 4 3	3 1 7	17 18 5	1,691 4 6	438 18 1	—	3	138	13
17 15 4	16 2 4	—	22 9 10	10 9 4	920 3 8	530 9 5	—	1 7	183	14
1,130 0 0	556 16 11	10 8 1	125 6 1	29 13 9	13,149 10 7	—	—	1 3	13,966	15
760 0 0	290 7 11	13 14 5	75 8 11	30 0 0	9,244 4 6	—	—			16
212 0 0	155 0 0	3 14 0	—	—	4,054 19 2	—	—	1 2$\frac{1}{2}$	4,703	17
193 2 5	149 11 0	—	63 1 0	206 0 5	4,681 11 3	1,572 4 4	—	9$\frac{1}{2}$	1,360	18
59 15 8	53 8 5	—	19 7 0	56 3 5	1,552 1 3	289 14 4	—	1 4	65	19
33 6 8	71 0 8	2 7 9	19 2 10	171 5 3	3,985 1 8	7 18 9	—	2 3	322	20
254 17 5	61 3 10	4 8 0	29 16 3	100 0 0	3,257 6 6	1,105 6 7	—	—	114	21
54 6 0	40 11 1	—	21 2 3	45 1 5	1,677 1 4	113 2 10	—	9$\frac{1}{2}$	99	22
—	142 4 3	—	25 8 1	98 6 0	3,961 0 2	2,955 5 9	—	1 2$\frac{1}{4}$	370	23
64 0 0	9 4 0	—	5 7 0	35 11 7	1,437 4 10	—	—	5$\frac{1}{16}$	75	24
202 17 10	61 12 9	—	20 2 1	36 10 4	2,057 4 0	—	21 0 0	1 4$\frac{3}{4}$	124	25
263 13 4	73 4 7	—	43 9 11	106 0 2	5,010 0 11	93 8 7	—	1 6$\frac{3}{8}$	193	26
144 10 0	26 15 7	—	10 7 9	28 17 3	1,179 18 6	536 1 6	—	10$\frac{1}{2}$	145	27
354 7 0	199 16 5	19 2 9	19 12 9	65 6 5	5,783 18 7	1,316 0 3	—	1 2$\frac{5}{8}$	1,258	28
117 9 10	34 19 9	1 14 0	11 11 7	12 6 3	1,669 18 1	20 7 7	—	1 3$\frac{1}{2}$	135	29
416 0 0	161 0 8	21 9 11	60 2 7	429 3 0	7,794 18 9	—	1,355 5 3	1 2	727	30
628 3 11	78 19 6	11 10 8	37 18 4	172 4 11	5,177 6 10	1,347 14 0	—	1 0$\frac{1}{2}$	398	31
—	36 14 9	12 5 5	14 12 6	25 3 9	1,261 10 2	789 14 9	—	†	†	32
7,793 17 2	3,573 18 1	188 9 3	1,031 12 2	3,305 1 7	137,487 17 11	15,694 4 1	1,672 4 0	—	—	

† See footnote on page 37.

No.	NAME OF SCHOOL (*Under the Management of Authorities other than School Boards*).	EXPEND: Balance (if overdrawn).	Salaries of Teachers.	Enlargement of School Buildings.	Books, Apparatus and Stationery.	Fuel, Light and Cleaning.	Replacement of Furniture, and Repairs to Buildings and Furniture.	Interest on Loans.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
33	Aberdeen, Robert Gordon's College	—	6,080 13 6	—	190 4 6	338 4 6	108 13 6	17 12 2
34	Anstruther, Waid Academy ..	—	873 9 2	—	91 0 10	42 14 0	118 2 3	—
35	Beith, Spier's School	—	1,218 7 6	—	17 9 5	135 0 2	232 16 7	—
36	Crieff, Morrison's Academy ..	—	2,406 1 10	—	74 14 8	57 2 7	292 18	—
37	Cupar, Bell Baxter School .	—	1,471 5 7	—	101 12 8	49 19 2	16 9 6	—
38	Dollar Institution .. .	103 13 1	3,251 0 0	—	313 17 3	101 3 10	201 8 2	—
39	Dundee High School	3,562 15 10	5,327 4 10	—	110 8 3	306 7 7	242 6 5	161 7 10
40	Edinburgh, Daniel Stewart's College	—	4,118 19 6	—	60 11 0	217 2 1	940 2 9	—
41	Edinburgh, George Watson's Boy's College	—	10,284 4 1	219 18 3	187 11 10	344 5 10	165 16 4	—
42	Edinburgh, George Watson's Ladies' College	—	7,463 12 4	171 10 9	149 11 10	350 17 7	125 13 1	—
43	Edinburgh Ladies' College ..	—	8,127 9 0	113 1 5	126 18 5	453 16 1	234 4 0	—
44	Glasgow, Allan Glen's School	—	4,370 12 8	—	826 15 3	335 8 0	332 6 2	202 4 11
45	Glasgow, Hutchesons' Boys' Grammar School ..	1,018 19 0	2,550 1 0	—	238 3 2	153 14 9	289 3 3	—
46	Glasgow, Hutchesons' Girls' Grammar School ..	—	2,991 4 4	—	306 9 4	142 11 10	130 12 10	—
47	Glasgow, St. Aloysius College	—	1,442 10 0	—	205 3 2	58 10 0	79 12 3	36 0 0
48	Inverness, Royal Academy ..	*1,421 17 0	2,067 17 9	—	35 16 1	94 1 7	43 0 8	—
49	Nairn, Rose's Academical Institution	—	755 9 9	—	19 2 2	43 15 5	13 11 11	—
50	Newton Stewart, Douglas and Ewart High Schools..	17 9 7	1,488 5 6	—	67 7 4	74 19 4	84 18 0	—
51	Perth, Sharp's Institution ..	263 18 10	1,375 0 0	—	69 8 0	129 8 3	67 6 10	—
52	St. Andrews, Madras College	432 12 11	1,970 5 2	—	31 10 3	74 1 7	36 14 6	—
53	Selkirk High School ..	—	545 12 0	—	32 10 3	35 3 7	3 12 11	50 11 10
54	Stonehaven, Mackie Academy	—	1,246 17 6	—	68 8 10	56 17 1	79 13 1	37 19 11
55	Tain Royal Academy ..	—	1,085 0 0	—	38 9 7	31 8 8	19 4 8	—
	Total	6,821 6 3	73,011 3 0	504 10 5	3,363 4 1	3,626 13 6	3,858 7 11	505 16 8
	Brought forward from previous page ..	6,376 4 1	85,370 16 10	8,785 17 10	3,417 13 5	5,836 5 4	4,423 7 7	7,384 14 7
	GRAND TOTAL	13,197 10 4	158,381 19 10	9,290 8 3	6,780 17 6	9,462 18 10	8,281 15 6	7,890 11 3

* This sum was (owing to a mistake made in 1887) incorrectly returned in 1904-5 as £2,507 15*s.* 10*d.*

ITURE.						BALANCE.		
Repayment of Loan.	Rent, Rates, Taxes and Insurance.	Expenses incident to Annual Examination.	Printing, Postages, Advertising, etc.	Other Expenses.	TOTAL EXPENDITURE	If in hand.	If overdrawn.	No.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
36 4 3	137 12 7	20 0 6	97 12 10	622 8 10	7,649 7 2	—	—	33
—	84 4 1	—	15 8 10	87 11 9	1,312 10 11	202 13 11	—	34
—	8 7 6	—	32 1 10	583 18 9	2,228 1 9	86 6 9	—	35
—	144 19 4	2 16 6	—	301 7 11	3,280 0 7	*430 13 6	—	36
—	31 12 4	—	7 5 10	135 11 5	1,813 16 6	265 11 5	—	37
—	141 4 4	—	55 16 1	516 11 2	4,684 13 11	559 7 6	—	38
—	182 7 2	2 8 9	104 17 6	446 13 3	10,446 17 5	—	3,082 9 0	39
—	794 10 0	—	210 19 10	1,234 10 9	7,576 15 11	—	—	40
—	1,850 15 3	8 14 0	178 16 10	2,389 5 8	15,629 8 1	—	—	41
—	1,539 13 11	7 10 0	227 10 4	2,176 12 8	12,212 12 6	—	—	42
—	1,392 14 1	11 14 3	192 0 7	2,778 18 0	13,430 16 3	—	—	43
266 13 4	57 9 5	24 6 7	181 5 7	430 10 9	7,027 12 8	588 14 8	—	44
—	135 1 6	19 6 0	51 6 2	1,027 4 2	5,482 19 0	—	566 19 6	45
—	201 13 6	20 0 2	47 10 2	878 16 1	4,718 18 3	3,964 7 10	—	46
—	137 10 1	1 0 0	27 10 0	116 13 1	2,104 8 7	—	—	47
—	185 1 5	10 4 6	8 16 11	274 15 9	4,141 11 8	—	1,438 16 3	48
63 15 11	5 14 7	—	13 15 2	45 15 9	961 0 8	40 4 3	—	49
—	82 12 6	—	25 16 3	111 5 5	1,952 13 11	125 18 9	—	50
—	48 0 2	19 17 8	30 2 8	137 2 4	2,640 4 9	—	274 14 11	51
—	87 2 11	9 7 9	17 6 3	343 3 4	3,002 4 8	—	432 3 9	52
53 6 8	8 2 7	—	9 7 0	44 8 3	782 15 1	†260 13 0	—	53
41 8 3	45 10 4	—	6 17 9	121 11 10	1,705 4 7	895 15 4	—	54
—	15 19 10	—	15 10 8	48 13 11	1,254 7 4	868 11 1	—	55
461 8 5	7,317 19 5	157 6 7	1,557 15 1	14,853 10 10	116,039 2 2	8,288 18 0	5,795 3 5	
7,793 17 2	3,573 18 1	188 9 3	1,031 12 2	3,305 1 7	137,487 17 11	15,694 4 1	1,672 4 0	
8,255 5 7	10,891 17 6	345 15 10	2,589 7 3	18,158 12 5	253,527 0 1	23,983 2 1	7,467 7 5	

* This includes £400 from Building Fund Account.
† This includes £31 5*s.* 11*d.* from Building Fund Account.

TABLE II.—SECONDARY SCHOOLS.

Particulars of the Grants paid (or promised) under paragraph 3 of the Minute of 27th April, 1899, in respect of the year 1906–1907.

Schools arranged under Counties.

	£
ABERDEEN—	
Aberdeen, Girls' High School	850
„ Grammar School	850
„ Robert Gordon's College	850
AYR—	
Ayr Academy	700
Beith, Spier's School	400
Irvine Royal Academy	850
BERWICK—	
Duns, Berwickshire High School	400
CLACKMANNAN—	
Dollar Institution	700
DUMFRIES—	
Dumfries Academy	850
EDINBURGH—	
Edinburgh, Dan. Stewart's College	550
„ Geo. Watson's Boys' College	850
„ Geo. Watson's Ladies' College	850
„ Ladies' College	850
„ Royal High School	600
ELGIN—	
Elgin Academy	600
FIFE—	
Anstruther, Waid Academy	400
Cupar, Bell Baxter School	400
Dunfermline High School	750
Kirkcaldy High School	700
St. Andrew's, Madras College	450
FORFAR—	
Arbroath High School	750
Brechin High School	550
Dundee High School	750
Forfar Academy	600
Montrose Academy	850
HADDINGTON—	
Haddington, Knox Institute	400
North Berwick High School	400
INVERNESS—	
Inverness Royal Academy	500
KINCARDINE—	
Stonehaven, Mackie Academy	400
KIRKCUDBRIGHT—	
Kirkcudbright Academy	400
LANARK—	
Glasgow, Allan Glen's School	850
„ High School	850
„ High School for Girls	600
„ Hutchesons' Boys' Grammar School	600
„ Hutchesons' Girls' Grammar School	650
„ St. Aloysius' College	450
Govan Hillhead School	650
Hamilton Academy	750
LINLITHGOW—	
Linlithgow Academy	550

SECONDARY SCHOOLS—*continued.*

	£
NAIRN—	
Nairn, Rose's Academical Institution	400
PEEBLES—	
Peebles Burgh and County High School	450
PERTH—	
Callander, McLaren High School	400
Crieff, Morrison's Academy	500
Perth Academy	850
Perth, Sharp's Institution	450
RENFREW—	
Greenock Academy	—
Paisley Grammar School and Wm. B. Barbour Academy	750
ROSS—	
Tain Royal Academy	400
ROXBURGH—	
Kelso High School	400
SELKIRK—	
Galashiels Academy	400
Selkirk High School	400
STIRLING—	
Falkirk High School	850
Stirling High School	850
WIGTOWN—	
Newtown Stewart, Ewart and Douglas High Schools	450
Stranraer High School	400
TOTAL	32,950

In addition to the above-named Secondary Schools, the following Schools, not in receipt of Grants, have been inspected by the Department during the Session 1906–07. An asterisk against the name of a School, signifies that that School did not present candidates at the Leaving Certificate Examination.

Aberdeen, Queen's Gate School.
Ayr, Newnham House School.
Blairs College.
*Broughty Ferry, Gartlands School.
Broughty Ferry, St. Margaret's School.
Dumfries, Benedictine Convent School.
Dundee, Constitution Road School.
Dundee, Lawside St. Joseph's Convent School.
Dundee, Seymour Lodge Girls' School.
Edinburgh Academy.
Edinburgh, Fettes College.
Edinburgh, George Heriot's Hospital School.
*Edinburgh, Girl's Home School.
Edinburgh Institution.
Edinburgh, Merchiston Castle School.
Edinburgh, Rosebery House School.
*Edinburgh, St. Bride's School.
Edinburgh, St. Elizabeth's School.
Edinburgh, St. George's High School for Girls.
Edinburgh, St. Margaret's Ladies' College (Branches at Newington and Morningside).
Edinburgh, The Ministers' Daughters' College.
Falkirk Selma House School.
Glasgow Academy.
Glasgow, Kelvinside Academy.
Glasgow, Kelvinside, Westbourne Gardens School for Girls.
Glasgow Park Girls' School.
*Glasgow, Rosslyn Terrace School.
Govan, Hillhead, Laurel Bank School for Girls.
Greenock, Clyde School.
Greenock, Collegiate School.
Greenock High School for Girls.
Helensburgh, Larchfield School.
Helensburgh, St. Bride's School.
Inverness College.
Inverness, St. Margaret's College.
Kilmacolm, St. Columba's School.
*Kircaldy Southbank School.
*Loretto School, Musselburgh.
*Melrose, St. Mary's School.
Newport-on-Tay, St. Fillan's House School.
*North Berwick, Dunardarigh School.
*Paisley, Caversbank School.
*Polmont, St. Margaret's School.
Portobello, Brunstane School for Girls.
St. Andrews, Clifton Bank School.
*Turriff Westwood School.

PREPARATORY SCHOOLS.

Cramond, Cargilfield School.
*Moffat, St. Ninian's School.
*Nairn, Alton Burn School.
*St. Andrews, St. Salvator's School.

TABLE III.

SECONDARY SCHOOLS.

Particulars of Grants for Science and Art Instruction paid under the Minute of 30th May, 1903, in respect of the year 1905–1906.

NAME OF SCHOOL.	Number of Students recognised for Grant.	GRANT FOR A Physical and Natural Science.	B Drawing.	C Practical Geometry and Educational Handwork.	D Cookery, Laundry-Work, Dress-making, or other Forms of Practical Household Economy	TOTAL AMOUNT PAID.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Aberdeen High School for Girls	182	154 15 3	50 12 7	—	45 16 4	251 4 2
Aberdeen Grammar School	173	341 6 6	70 6 6	49 7 4	—	461 0 4
Aberdeen Robert Gordon's College.. ..	507	1,618 10 0	208 3 2	445 14 1	—	2,272 7 3
Anstruther, Waid Academy	82	175 14 3	44 7 6	—	—	220 1 9
Arbroath High School	292	187 4 0	104 18 10	47 13 4	49 8 0	389 4 2
Brechin High School	83	140 19 3	55 16 3	—	—	196 15 6
Callander, McLaren High School	64	91 17 0	26 13 7	—	—	118 10 7
Cupar, Bell Baxter School	46	81 4 3	23 5 1	—	—	104 9 4
Dollar Institution ..	187	259 1 6	85 2 4	52 9 6	—	396 13 4
Dumfries Academy ..	119	158 17 6	65 0 0	20 15 10	—	244 13 4
Dumfries, Mount St. Michael's College ..	12	34 11 1	10 5 6	15 19 0	—	60 15 7
Dumfries, St. Joseph's College	150	44 18 0	20 6 1	42 2 4	—	107 6 5
Dundee High School ..	176	285 17 9	77 1 4	73 3 8	60 1 8	496 4 5
Dunfermline High School	220	532 9 4	58 19 1	132 13 11	47 9 10	771 12 2
Duns, The Berwickshire High School ..	76	46 16 1	19 17 3	8 15 4	8 14 10	84 3 6
Edinburgh, George Watson's Boys' College	101	139 5 6	35 6 3	—	—	174 11 9
Edinburgh, George Watson's Ladies' College	131	64 4 9	45 7 9	—	—	109 12 6
Edinburgh Ladies' College	364	117 9 0	138 2 1	—	—	255 11 1
Edinburgh, Royal High School	14	30 18 3	5 16 4	1 6 2	—	38 3 3
Elgin Academy ..	101	99 11 3	43 1 0	—	—	142 12 3
Falkirk High School ..	226	213 12 6	101 12 9	50 5 3	59 2 6	424 13 0
Forfar Academy ..	184	350 9 3	86 0 4	32 7 8	38 2 8	506 19 11
Glasgow, Allan Glen's School	514	1,952 3 1	208 13 0	699 14 6	—	2,860 10 7
Glasgow High School ..	31	53 2 6	—	—	—	53 2 6
Glasgow High School for Girls	20	24 6 9	—	—	—	24 6 9

NAME OF SCHOOL.	Number of Students recognised for Grant.	GRANT FOR A Physical and Natural Science.	GRANT FOR B Drawing.	GRANT FOR C Practical Geometry and Educational Handwork.	GRANT FOR D Cookery, Laundry-Work, Dress-making, or other Forms of Practical Household Economy.	TOTAL AMOUNT PAID
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Glasgow, St. Aloysius' College	139	129 18 3	48 7 10	—	—	178 6 1
Govan Hillhead School	50	99 15 6	—	—	—	99 15 6
Greenock Academy ..	149	214 10 6	55 11 6	—	29 18 0	300 0 0
Haddington, Knox Institute	46	53 2 3	24 3 3	14 8 0	8 12 0	100 5 6
Hamilton Academy ..	224	378 9 11	129 16 6	59 16 9	75 2 6	643 5 8
Inverness Royal Academy	32	64 8 9	11 13 10	9 10 8	—	85 13 3
Irvine Royal Academy	130	242 8 0	104 6 3	68 6 8	88 13 4	503 14 3
Kelso High School ..	13	12 8 0	—	—	—	12 8 0
Kirkcaldy High School	118	175 4 6	60 6 1	—	—	235 10 7
Kirkcudbright Academy	50	85 2 0	21 19 10	—	—	107 1 10
Linlithgow Academy ..	143	149 11 3	69 13 10	—	8 4 0	227 9 1
Montrose Academy ..	222	373 19 3	127 15 1	145 5 3	29 4 8	676 4 3
Nairn Rose's Academical Institution ..	19	26 4 6	7 9 10	—	—	33 14 4
Newton Stewart Douglas High School (Girls)	21	45 4 0	9 17 10	—	—	55 1 10
Newton Stewart Ewart High School (Boys)	35	1 6 3	13 1 6	30 19 7	—	152 18 4
North Berwick High School	72	80 8 0	27 8 3	13 8 2	8 18 6	130 2 11
Paisley Grammar School and Wm. B. Barbour Academy ..	178	270 11 0	64 3 1	50 2 6	49 2 0	433 18 7
Peebles Burgh and County High School	58	93 2 0	26 15 4	19 14 4	6 15 6	146 7 2
Perth Academy ..	335	662 0 3	183 10 4	144 17 2	58 9 6	1,048 17 3
Perth, Sharp's Institution	187	495 2 3	121 2 3	103 7 9	46 8 10	766 1 1
St. Andrews, Madras College	75	104 19 11	31 14 1	—	5 9 0	142 3 0
Selkirk High School ..	45	70 4 9	9 0 9	—	9 19 0	89 4 6
Stirling High School	268	360 18 6	176 6 10	5 11 8	31 6 6	574 3 6
Stonehaven, Mackie Academy	103	115 13 6	32 4 4	19 18 6	42 19 0	210 15 10
Stranraer High School	45	65 7 6	—	—	—	65 7 6
Tain Royal Academy	90	99 3 9	33 6 6	41 15 4	9 10 8	183 16 3
Totals	6,812	11,776 8 11	2,974 9 6	2,399 1 3	817 9 4	17,967 11 6

TABLE

STATEMENT for the year 1905–1906, showing the Number of Pupils of various ages on the the Secondary Schools in Scotland claiming Grant

No	NAME OF SCHOOL. (*Under the Management of School Boards.*)	NUMBER OF PUPILS ON THE SCHOOL ROLL														
		Under 12 Years.			Between 12 and 13.			Between 13 and 14.			Between 14 and 15.			Between 15 and 16.		
		Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.
1	Aberdeen, Girls' High School	25	154	179	—	36	36	—	34	34	—	62	62	—	65	65
2	Aberdeen Grammar School	196	—	196	45	—	45	65	—	65	57	—	57	55	—	55
3	Arbroath High School	9	7	16	19	12	31	35	29	64	23	21	44	11	33	44
4	Ayr Academy	69	45	114	19	10	29	24	24	48	27	25	52	27	28	55
5	Brechin High School	2	2	4	4	10	14	11	11	22	12	11	23	11	18	29
6	Callander, McLaren High School	—	—	—	2	—	2	3	6	9	6	3	9	14	7	21
7	Dumfries Academy	64	42	106	18	15	33	36	24	60	34	28	62	33	30	63
8	Dunfermline High School	—	—	—	15	10	25	33	19	52	48	35	83	37	31	68
9	Duns, Berwickshire High School	—	—	—	1	4	5	8	10	18	10	17	27	9	9	18
10	Edinburgh Royal High School	172	—	172	43	—	43	57	—	57	69	—	69	59	—	59
11	Elgin Academy	29	21	50	12	9	21	18	10	28	11	8	19	15	10	25
12	Falkirk High School	—	—	—	1	2	3	30	18	48	36	28	64	22	32	54
13	Forfar Academy	—	—	—	—	1	1	17	5	22	32	22	54	22	29	51
14	Galashiels Academy	17	7	24	6	2	8	5	7	12	11	5	16	9	7	16
15	Glasgow High School	199	—	199	82	—	82	92	—	92	172	—	172	164	—	164
16	Glasgow High School for Girls	—	199	199	—	74	74	—	97	97	—	139	139	—	166	166
17	Govan, Hillhead School	1	—	1	4	2	6	20	34	54	47	43	90	25	28	53
18	Greenock Academy	133	122	255	31	21	52	28	36	64	33	26	59	39	29	68
19	Haddington, Knox Institute	16	27	43	5	2	7	5	13	18	6	11	17	5	10	15
20	Hamilton Academy	13	13	26	17	15	32	28	16	44	22	28	50	20	23	43
21	Irvine Royal Academy	55	48	103	18	10	28	32	9	41	30	22	52	28	22	50
22	Kelso High School	23	11	34	9	3	12	4	1	5	6	10	16	8	5	13
23	Kirkcaldy High School	—	—	—	8	1	9	11	7	18	18	29	47	17	23	40
24	Kirkcudbright Academy	4	3	7	14	7	21	7	12	19	14	13	27	10	4	14
25	Linlithgow Academy	27	23	50	7	9	16	15	18	33	23	9	32	10	13	23
26	Montrose Academy	13	10	23	20	7	27	17	27	44	46	26	72	27	20	47
27	North Berwick High School	—	—	—	2	3	5	7	10	17	9	5	14	4	2	6
28	Paisley Grammar School	101	60	161	22	18	40	32	20	52	26	32	58	36	18	54
29	Peebles High School	14	15	29	6	2	8	13	4	17	15	7	22	6	4	10
30	Perth Academy	81	70	151	19	14	33	45	41	86	42	26	68	49	42	91
31	Stirling High School	9	5	14	19	16	35	24	31	55	34	43	77	38	33	71
32	Stranraer High School	10	7	17	3	6	9	5	4	9	11	8	19	9	7	16
	CARRIED FORWARD	1282	891	2173	471	321	792	727	577	1304	930	742	1672	819	748	1567

IV.

School Roll, the Average Attendance of Pupils, and the number of Teachers employed in under paragraph 3 of the Minute of 27th April, 1899.

AT THE CLOSE OF THE SCHOOL YEAR.																Number of Scholars in actual average attendance throughout the year.				Number of Teachers.			No.
Between 16 and 17.			Between 17 and 18.			Between 18 and 19.			Over 19 years.			Total number of Scholars over 12 years.			Grand Total.									
Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Under 12.	Between 12 and 15.	Over 15.	Total.	Teachers whose whole time is spent in the School. Graduates.	Non-Graduates.	Visiting Teachers.	
—	46	46	—	38	38	—	20	20	—	27	27	—	328	328	25	482	507	161	119	176	456	13	32	6	1
27	—	27	17	—	17	4	—	4	—	—	—	270	—	270	466	—	466	184	157	97	438	16	7	6	2
10	15	25	3	9	12	—	1	1	—	—	—	101	120	221	110	127	237	15	137	87	239	5	8	2	3
18	15	33	6	12	18	3	3	6	—	6	6	124	123	247	198	168	361	100	117	113	330	11	7	4	4
12	10	22	1	8	9	—	6	6	—	5	5	51	79	130	53	81	134	4	56	67	127	4	5	—	5
6	4	10	4	4	8	2	4	6	—	—	—	37	28	65	37	28	65	—	18	40	58	3	2	3	6
18	17	35	9	18	27	1	6	7	1	1	2	150	139	289	214	181	395	98	148	128	374	12	14	—	7
15	26	41	9	22	31	3	12	15	—	8	8	160	163	323	160	163	323	—	153	156	309	11	8	—	8
4	5	9	2	6	8	—	3	3	—	1	1	34	55	89	34	55	89	—	46	43	89	3	2	7	9
32	—	32	7	—	7	2	—	2	2	—	2	271	—	271	443	—	443	157	160	99	416	15	5	3	10
12	18	30	6	5	11	—	6	6	3	2	5	77	68	145	100	89	195	44	66	72	182	6	6	2	11
6	19	25	1	12	13	2	7	9	2	10	12	100	128	228	100	128	228	—	115	102	217	5	7	5	12
14	15	29	6	9	15	—	—	—	—	—	—	91	81	172	91	81	172	—	70	92	162	7	11	3	13
5	6	11	—	3	3	—	—	—	—	—	—	36	30	66	53	37	90	18	36	31	85	5	1	3	14
107	—	107	35	—	35	10	—	10	1	—	1	663	—	663	862	—	862	199	334	307	840	31	12	2	15
—	121	121	—	69	69	—	41	41	—	17	17	—	724	724	—	923	923	177	275	368	820	16	23	11	16
5	26	31	2	10	12	—	9	9	—	4	4	103	156	259	104	156	260	2	162	111	275	7	8	8	17
19	22	41	8	5	13	—	2	2	—	1	1	158	142	300	291	264	555	210	146	124	480	12	14	3	18
4	3	7	—	1	1	—	1	1	—	—	—	25	41	66	41	68	109	35	40	27	102	4	3	1	19
16	24	40	9	10	19	6	12	18	—	6	6	118	134	252	160	147	278	22	125	124	271	9	8	4	20
15	13	28	11	9	20	2	6	8	1	5	6	137	96	233	192	144	336	91	108	105	304	5	6	4	21
4	5	9	2	6	8	—	1	1	—	—	—	33	31	64	56	42	98	29	27	29	85	5	5	7	22
11	19	30	6	14	20	4	6	10	3	10	13	78	109	187	78	109	187	—	72	126	198	3	6	6	23
6	3	9	1	2	3	—	—	—	—	1	1	52	42	94	56	45	101	7	65	26	98	5	1	1	24
6	11	17	2	4	6	—	3	3	—	5	5	63	72	135	90	95	185	47	75	53	175	5	4	4	25
15	20	35	6	13	19	—	4	4	1	6	7	132	123	255	145	133	278	20	136	117	273	11	4	5	26
9	4	13	3	1	4	—	5	5	—	—	—	34	30	64	34	30	64	—	34	30	64	5	2	4	27
20	14	34	10	6	16	2	6	8	—	1	1	148	115	263	249	175	424	157	133	102	392	10	8	10	28
2	6	8	—	2	2	1	1	2	—	3	3	43	29	72	57	44	101	21	43	22	86	6	3	2	29
24	48	72	13	31	44	3	23	26	—	9	9	195	234	429	276	304	580	130	175	217	522	12	21	4	30
23	30	53	10	23	33	3	15	18	—	8	8	151	199	350	160	204	364	13	155	174	342	11	8	4	31
3	9	12	—	6	6	—	3	3	—	2	2	31	45	76	41	52	93	13	33	38	84	4	4	1	32
468	574	1042	189	358	547	48	206	254	14	138	152	3666	3664	7330	4948	4555	9503	1954	3536	3403	8893	277	255	125	

TABLE

No.	Name of School. (*Under the Management of Authorities other than School Boards.*)	Number of Pupils on the School Roll														
		Under 12 years.			Between 12 and 13.			Between 13 and 14.			Between 14 and 15.			Between 15 and 16.		
		Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.
33	Aberdeen, Robert Gordon's College	71	—	71	87	—	87	139	—	139	160	—	160	166	—	166
34	Anstruther, Waid Academy	—	—	—	1	—	1	10	6	16	14	15	29	10	13	23
35	Beith, Spier's School	10	10	20	1	6	7	9	8	17	9	8	17	11	5	16
36	Crieff, Morrison's Academy	32	24	56	14	4	18	24	5	29	15	13	28	23	17	40
37	Cupar, Bell Baxter School	21	22	43	8	4	12	9	6	15	12	5	17	3	14	17
38	Dollar Institution	23	17	40	19	12	31	40	22	62	37	20	57	40	20	60
39	Dundee High School	88	32	120	26	13	39	34	13	47	43	20	63	33	26	59
40	Edinburgh, Daniel Stewart's College	256	—	256	55	—	55	68	—	68	71	—	71	46	—	46
41	Edinburgh, George Watson's Boys' College ..	508	—	508	133	—	133	160	—	160	187	—	187	184	—	184
42	Edinburgh, George Watson's Ladies' College..	—	298	298	—	82	82	—	86	86	—	96	96	—	98	98
43	Edinburgh Ladies' College	—	320	320	—	94	94	—	100	100	—	103	103	—	102	102
44	Glasgow, Allan Glen's School	30	—	30	50	—	50	104	—	104	162	—	162	163	—	163
45	Glasgow, Hutchesons' Boys' Grammar School	71	—	71	36	—	36	50	—	50	64	—	64	47	—	47
46	Glasgow, Hutchesons' Girls' Grammar School	—	81	81	—	52	52	—	53	53	—	58	58	—	44	44
47	Glasgow, St. Aloysius College	82	—	82	20	—	20	35	—	35	59	—	59	32	—	32
48	Inverness Royal Academy	41	48	89	11	9	20	21	17	38	15	13	28	9	12	21
49	Nairn, Rose's Academical Institution.. ..	20	23	43	7	2	9	2	1	3	3	12	15	3	4	7
50	Newton Stewart, Ewart and Douglas High Schools.	18	8	26	3	5	8	7	2	9	7	4	11	11	7	18
51	Perth, Sharp's Institution	3	—	3	6	1	7	30	22	52	37	38	75	15	24	39
52	St. Andrews, Madras College	46	46	92	10	9	19	11	8	19	15	13	28	21	16	37
53	Selkirk High School	6	2	8	—	1	1	6	2	8	5	5	10	10	2	12
54	Stonehaven, Mackie Academy	12	8	20	4	3	7	10	6	16	12	18	30	12	9	21
55	Tain Royal Academy	10	19	29	—	2	2	7	3	10	13	9	22	11	9	20
	Total	1348	958	2306	491	299	790	776	360	1136	940	450	1390	850	422	1272
	Brought forward from previous page	1282	891	2173	471	321	792	727	577	1304	930	742	1672	819	748	1567
	Grand Total ..	2630	1849	4479	962	620	1582	1503	937	2440	1870	1192	3062	1669	1170	2839

IV.—*Continued.*

AT THE CLOSE OF THE SCHOOL YEAR.																Number of Scholars in actual average attendance throughout the year.				Number of Teachers.			No.
Between 16 and 17.			Between 17 and 18.			Between 18 and 19.			Over 19 years.			Total number of Scholars over 12 years.			Grand Total.								
Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Under 12.	Between 12 & 15.	Over 15.	Total.	Teachers whose whole time is spent in the School. Graduates	Non-Graduates	Visiting Teachers.	
129	—	129	52	—	52	34	—	34	21	—	21	788	—	788	859	—	859	66	362	372	800	24	7	—	33
3	9	12	2	5	7	1	4	5	—	1	1	41	53	94	41	53	94	—	46	47	93	4	1	2	34
6	2	8	3	2	5	2	2	4	—	—	—	41	33	74	51	43	94	19	38	32	89	5	2	1	35
22	11	33	13	9	22	2	3	5	—	—	—	113	62	175	145	86	231	48	69	100	217	8	9	1	36
7	14	21	1	8	9	—	—	—	—	—	—	40	51	91	61	73	134	36	38	44	118	4	9	—	37
31	20	51	17	10	27	2	2	4	1	4	5	187	110	297	210	127	337	38	145	142	325	9	11	2	38
28	17	45	22	18	40	7	6	13	2	6	8	195	119	314	283	151	434	95	133	146	374	15	17	1	39
34	—	34	10	—	10	1	—	1	—	—	—	285	—	285	541	—	541	251	176	76	503	11	6	6	40
114	—	114	78	—	78	36	—	36	3	—	3	895	—	895	1,403	—	1,403	468	447	399	1,314	25	25	5	41
—	68	68	—	40	40	—	23	23	—	8	8	—	501	501	—	799	799	258	257	212	727	11	51	12	42
—	103	103	—	57	57	—	39	39	—	7	7	—	605	605	—	925	925	290	274	288	852	11	60	12	43
64	—	64	15	—	15	2	—	2	—	—	—	560	—	560	590	—	590	26	300	243	569	15	9	4	44
36	—	36	16	—	16	6	—	6	6	—	6	261	—	261	332	—	332	64	138	103	305	7	6	4	45
—	44	44	—	20	20	—	9	9	—	4	4	—	284	284	—	365	365	73	153	114	340	9	10	9	46
23	—	23	5	—	5	6	—	6	1	—	1	181	—	181	263	—	263	76	110	63	249	4	9	2	47
18	6	24	10	9	19	3	2	5	4	1	5	91	69	160	132	117	249	73	76	62	211	6	6	2	48
3	4	7	2	4	6	1	5	6	—	4	4	21	36	57	41	59	100	37	26	27	90	2	5	1	49
5	5	10	7	5	12	1	1	2	—	—	—	41	29	70	59	37	96	25	28	42	95	3	6	2	50
13	10	23	3	5	8	—	—	—	—	—	—	104	100	204	107	100	207	3	122	58	183	6	7	2	51
10	13	23	2	6	8	1	1	2	—	1	1	70	67	137	116	113	229	84	62	69	215	6	6	5	52
5	7	12	2	2	4	—	1	1	—	1	1	28	21	49	34	23	57	7	17	26	50	3	1	2	53
9	7	16	6	2	8	1	6	7	—	1	1	54	52	106	66	60	126	18	47	54	119	6	1	4	54
9	10	19	4	8	12	—	2	2	—	2	2	44	45	89	54	64	118	27	31	51	109	3	4	2	55
569	350	919	270	210	480	106	106	212	38	40	78	4040	2237	6,277	5,388	3195	8,583	2082	3095	2770	7,947	197	268	81	
468	574	1042	189	358	547	48	206	254	14	138	152	3666	3664	7,330	4,948	4555	9,503	1954	3536	3403	8,893	277	255	125	
1037	924	1961	459	568	1027	154	312	466	52	178	230	7706	5901	13,607	10,336	7750	18,086	4036	6631	6173	16,840	474	523	206	

TABLE V.

I. FUND established under paragraph 6 of the Minute of 27th April 1899.

				£	s.	d.
Payment into Fund for the year			1899–1900	7,659	16	0
,,	,,	,,	1900–1901	9,345	19	0
,,	,,	,,	1901–1902	9,837	15	6
,,	,,	,,	1902–1903	7,438	2	1
,,	,,	,,	1903–1904	4,539	15	8
,,	,,	,,	1904–1905	2,689	11	11
,,	,,	,,	1905–1906	2,051	19	8
,,	,,	,,	1906–1907	987	19	11
		Total		£44,550	19	9

Grants to the amount of 22,277*l.* 0*s.* 10*d.*, particulars of which will be found in last year's Report, have been made from the Fund during the years 1901 to 1906.

Balance standing to the credit of the Fund, 22,273*l.* 18*s.* 11*d.*

II. SUM available under paragraph 2 of the Minute of 27th April 1899.

Balance available for Agricultural Education as shown on page 49 of last year's Report, £2,692 10*s.* 7*d.*

Further payments during 1906–1907.	£	s.	d.
Inspection Expenses of the Agricultural Institutions	82	14	3
Aberdeen and North of Scotland College of Agriculture—Grant in aid of capital expenditure	157	8	6
Edinburgh and East of Scotland College of Agriculture—Forestry Classes conducted in the University of Edinburgh	100	0	0
Edinburgh and East of Scotland College of Agriculture—Grants in aid of capital expenditure	500	0	0
The West of Scotland Agricultural College—Capital Grant, Holmes Farm, Kilmarnock	600	0	0
	£1,440	2	9

1907–1908. SUM available, £3,252 7*s.* 10*d.*	£	s.	d.
The West of Scotland Agricultural College—Capital Grants, Holmes Farm, Kilmarnock, and College equipment	1,000	0	0
Balance	2,252	7	10
	£3,252	7	10

TABLE VI.

SYNOPSIS of the SCHEMES of BURGH and COUNTY COMMITTEES as approved by the SCOTCH EDUCATION DEPARTMENT, for the distribution of the sums* available under the Minute of 10th June 1897, as amended by the Minute of 30th April 1900, and under the Minute of 19th March 1906, for SECONDARY EDUCATION in their respective districts for the year ended 31st March 1907, and also of any sums entrusted to the COMMITTEES by LOCAL AUTHORITIES for purposes of Technical Education.

ABERDEEN BURGH.

Grant for year ended 31st March 1907 :—	£	*s.*	*d.*
Under the Minute of 10th June 1897 - - - -	1,830	8	4
„ „ „ *19th March* 1906 - - -	858	2	3

Scheme approved 26th February 1907.

Allocation of grant :—

I. Payment of three-fourths of a certified deficiency as shewn by the School Accounts, but not exceeding the following amounts :—

		£	*s.*	*d.*
Aberdeen Grammar School -	Aberdeen School Board.	500	0	0
„ Girls' High School -		500	0	0
„ Central Higher Grade Public School -		75	0	0
„ Robert Gordon's College - - -		500	0	0
„ C. of S. Practising Higher Grade School		150	0	0
„ U.F.C. Normal Higher Grade School		75	0	0

II. The balance of £948 3*s.* 11*d.*—subject to expenses of Committee—placed to a reserve fund for Bursaries, &c., for Junior Students.

ABERDEEN COUNTY.

Grant for year ended 31st March 1907 :—	£	*s.*	*d.*
Under the Minute of 10th June 1897 - - - -	1,902	17	0
„ „ „ „ *19th March* 1906 - - - -	896	4	8
Contributions by local authorities - - - - -	590	1	3

Scheme approved, 2nd January 1907.

Allocation of grant :—

A.—SECONDARY EDUCATION.

I. 100*l.* each to Huntly Gordon, and to Peterhead (Burgh) Academy Higher Grade Public Schools, recognised as Centres of Instruction for Junior Students = 200*l.*

II. Such proportion, not exceeding two-thirds, of the deficit on the Higher Grade Schools, or schools intending to become Higher Grade, as the funds may admit of. No grant to exceed 150*l.* or fall below 10*l.*

III. To teachers of schools not otherwise aided under this Scheme, on account of the preliminary instruction of pupils who subsequently continue their studies at a Higher Grade or Secondary Department or School = 250*l.*

IV. (a) Intermediate Bursaries tenable for not more than three years at Higher Grade or approved Intermediate or Secondary Departments, by pupils qualified in terms of Article 29 of the Code.

(b) Secondary Bursaries, tenable for not more than three years at a school approved by the Committee, by pupils who hold the Intermediate Certificate.

* In some cases where the Committees have a balance in hand from the previous year, the sums allocated under their Schemes may exceed in amount the grant payable to them in respect of the year ended 31st March 1907.

Travelling allowances may be added to either class of Bursary, or may be granted without a Bursary; and a maintenance allowance not exceeding 5*l.* per annum may be given where necessary.

B.—Technical Instruction.

I. For the equipment of schools intending to become Higher Grade = 300*l.*

II. For Local Technical Classes = 150*l.*

III. Grants to Aberdeen Navigation School and Aberdeen Asylum for the Blind, if funds permit.

ARGYLL COUNTY.

	£	s.	d.
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897 - - -	988	10	10
" " " " 19*th March* 1906 - - - -	415	0	5

Scheme approved, 10*th December* 1906.

Allocation of grant :—

1. Expenses of Committee - - - - - - £60

2. For division equally between the following schools, but subject to a maximum of three-fourths of the deficit in each case :—

Campbeltown (Burgh) Grammar Higher Grade Public School. Dunoon Grammar Higher Grade Public School. Oban High Higher Grade Public School.	£600

3. For division amongst the following schools, in proportion to, but not exceeding three-fourths of, the deficit incurred in giving advanced instruction in secondary subjects, on lines approved by the Department for the Intermediate Certificate Examination, to pupils who have passed the Qualifying Examination (Article 29 of the Code) :—

Kilarrow and Kilmeny, Bowmore Higher Grade Public School. Tobermory Public School. Lochgilphead Public School. Tarbert Public School. Tighnabruaich Public School.	£200

4. Grants under Head 3 must be devoted to Secondary Education, and not to relief of rates.

5. (1) Secondary Bursaries of the minimum value of 5*l.*, which may with approved travelling or maintenance allowance, amount to 20*l.*, open to pupils holding the Intermediate Certificate; tenable for two or three years at a centre of instruction approved by the Department in the case of Junior Students, and at a Higher Grade or Secondary School approved by the Committee in the case of other scholars.

(2) Intermediate Bursaries of the minimum value of 5*l.*, which may, with approved travelling or boarding allowance, amount to a sum not exceeding 15*l.*; tenable in ordinary cases for three years at an approved Higher Grade or Secondary School, and open to pupils qualified in terms of Article 29 of the Code who reside upwards of three miles from an Intermediate School, or are separated from it by an arm of the sea.

(3) In awarding Bursaries, the claims of Junior Students will receive special consideration, and as far as possible the Bursaries will be equitably distributed over the Schools or School Board areas from which the applicants are drawn.

AYR COUNTY.

	£	s.	d.
Grant for year ended 31st March 1907 :—			
Under the Minute of 10th June 1897 - - - -	2,906	0	11
„ „ „ „ *19th March* 1906 - - - -	1,424	4	8
Contributions of local authorities - - - - - -	2,146	6	3

Secondary and Technical schemes approved, 4th January 1907.

Allocation of Grant :—

SECONDARY EDUCATION.

	£.
I. Secondary Schools :—	
Ayr Academy - - - - - - - -	500
Irvine Royal Academy - - - - -	400
Beith, Spier's School - - - - -	120
Kilmarnock (Burgh) Academy Higher Grade Public School - - - - -	500
Ardrossan Academy Higher Grade Public School - - - - - - - -	300

The above grants are conditional upon the provision of one free place for every 10*l.* paid.

	£.
II Intermediate Schools :—	
Girvan (Town) Higher Grade Public School -	130
Old Cummock Higher Grade Public School -	130
Maybole, Carrick Academy Higher Grade Public School - - - - - - -	130
Dalry Higher Grade Public School - - -	70
Largs Higher Grade Public School - - -	70
Beith Academy Public School - - - -	100
III. Bursaries awarded under former Schemes - -	540
IV. Secondary and Intermediate Bursaries, as under -	1,000

(a) Secondary Bursaries of the normal value of 10*l.*, open to candidates who hold the Intermediate Certificate, and who propose to continue their education at an approved Secondary School. Junior Students have first claim on these Bursaries.

(b) Intermediate Bursaries of amounts to be determined in each particular case, to pupils qualified in terms of Article 29 of the Code, who desire to attend an Intermediate or Secondary School. Preference to be given to candidates whose attendance at a central school will involve outlay for travelling or maintenance; other scholars must be over 14. Bursaries will be equitably distributed over the schools from which applications are received.

	£	s.	d.
V. Expenses of Committee - - - - - -	100	5	7
Special Fund - - - - - - - - - -	40	0	0

TECHNICAL INSTRUCTION.

	£.
VI. (1) To the West of Scotland Agricultural College :—	
(*a*) Grant to General Funds of College - - - -	550
(*b*) Bursaries for farmers attending Special Month's Course	20
(*c*) Bursaries for attendance of not less than one month at the Dairy School - - - - - -	15
(*d*) Bursaries for foresters attending Special Month's Course - - - - - - - - -	10
(2) Continuation Classes :—	
(*a*) Grants, under certain conditions, equal to one-half of the sum contributed locally towards Technical Instruction by the Town Council, to Burgh School Boards in aid of Schemes of Technical Instruction as outlined in Divisions II. and III. of the Continuation Class Code - -	780

	£
(*b*) Grant to Parish School Boards or Local Committees in aid of approved Schemes of Technical Instruction	510
(*c*) Towards Salaries of County Lecturers and Assistants	140
(3) Short courses of Lectures and Demonstrations not suitable for registration under the Continuation Class Code	10
(4) Railway fares of Students at Technical Classes	300
(5) Prizes for promoting original work and design	50
(6) (*a*) Junior Scholarships (Article 79 (a) Continuation Class Code) open to pupils in rural districts, and of amounts dependent on the distance of the student's home from the place of instruction, and on the need for assistance	160
(*b*) Six Senior Scholarships (Article 79 (b) Continuation Class Code)—two vacant each year—of 50*l.* tenable for three years	150
VII. Expenses of organisation, etc.	325

BANFF COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897	856	5	9
" " " 19*th March* 1906	345	8	3
Contributions by local authorities	47	13	0

Secondary and Technical Schemes approved, 8th January, 1907.

Allocation of grant :—

I. Secondary Education.

	£	*s.*	*d.*
I. Expenses of Committee	65	0	0

II. (*a*) Grants to the following Higher Grade Schools :—

	£	*s.*	*d.*
Aberlour Higher Grade Public School	65	0	0
Banff (Burgh) Academy Higher Grade Public School	95	0	0
Fordyce Academy Higher Grade Public School	160	0	0
Keith Higher Grade Public School	95	0	0
Mortlach Higher Grade Public School	65	0	0
Rathven, Buckie Higher Grade Public School	80	0	0
(*b*) Grants to the following Schools :—			
Botriphnie Public School	10	0	0
Boyndie Public School	10	0	0
Cullen Public School	25	0	0
Engie, Portgordon Public School	10	0	0
Fordyce, Portsoy Public School	23	0	0
Gamrie, Macduff Public School	40	0	0
Glenrinnes Public School	10	0	0
Inveravon Public School	15	0	0
Inveravon, Glenlivet Public School	10	0	0
Kirkmichael, Tomintoul Public School	15	0	0
Marnoch, Aberchirder Public School	30	0	0
Rathven, &c., Portnockie Public School	12	0	0
Rothiemay Public School	15	0	0

III. The grants under Head II. are subject to the condition that they shall in no case exceed two-thirds of the certified deficiency on the higher department.

II. Training of Teachers.

VIII.–XII. Secondary Bursaries of 8*l.* (with allowances for travelling and other expenses when necessary) to twenty candidates nominated as Junior Students. In the event of a Student holding any other bursary, the grant to be limited to the amount required to make up an aggregate sum of 15*l.*

XIII.-XX. Intermediate Bursaries of 3*l.* (with allowances for travelling and other expenses when necessary) to pupils who have not yet obtained the Intermediate Certificate, one for each Parish, with an additional bursary for every complete 500 pupils in average attendance after the first 200 at Schools aided by Parliamentary Grants.

TECHNICAL EDUCATION.

Sums contributed by the Burghs of Buckie and Keith (viz. :—37*l.* 6*s.* 4*d.* and 10*l.* 6*s.* 8*d.* respectively) to be handed to the School Boards to be applied towards Technical Education in Continuation Classes in those Burghs.

BERWICK COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - - -	530	12	6
" " " " 19*th March* 1906 - - - - -	174	0	3
Contributions by local authorities - - - - -	539	3	0

Secondary and Technical Schemes approved 7th January 1907.

Allocation of grant :—

	£	*s.*	*d.*
1. To Duns, Berwickshire High School (conditional upon a sufficient proportion of the grant being devoted to payment of students' travelling expenses) - - - - - -	910	0	0
2. To Coldstream Public School - - - - - -	50	0	0
To Lauder Public School - - - - - - -	30	0	0

The grants to these two schools may, after this year, be withdrawn if their curricula is not such as to qualify pupils for the award of the Intermediate Certificate.

	£	*s.*	*d.*
3. To Edinburgh and East of Scotland College of Agriculture	50	0	0
4. Towards the railway fares of students from Earlston to Galashiels Technical School - - - - - -	4	0	0
5. Secondary Bursaries, including travelling and maintenance expenses, to nine candidates (formerly Pupil Teachers) to enable them to obtain the Intermediate Certificate in order to qualify as Junior Students - - - - -	131	16	0
To Reserve Fund, if not expended on bursaries - - -	42	4	3
6. Expenses of Committee - - - - - - -	25	15	6

BUTE COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - - -	399	10	11
" " " " 19*th March* 1906 - - - - -	105	0	6

Scheme approved 1st December 1906.

Allocation of grant :—	£
(a). Expenses of Committee - - - - - - - - -	20
(b). (1). Six Bursaries of 15*l.*, tenable at Rothesay Academy, by scholars from Arran (4) and Cumbrae (2) - - - - -	90
(2). Grants of 2*l.* to three scholars from Kingarth parish attending Rothesay Academy as free scholars - - - - -	6
(3). Free education in Rothesay Academy to three scholars from North Bute parish, with 1*l.* to pay travelling expenses of selected scholars residing in the vacinity of Ettrick Bay -	1
(c) Fixed Grant to Rothesay Academy, on condition that certain free places are given - - - - - - - - - - -	300

(d). (1). Secondary Bursaries, open to pupils who, having obtained the Intermediate Certificate, propose to continue their education at a Secondary School. These Bursaries are of the value of 6*l.* per annum, with the addition of a maintenance allowance at the Committee's discretion. Junior Students have the first claim on them.

(2). Intermediate Bursaries, open to pupils who, having passed the qualifying Examination, have proceeded or are about to proceed to an Intermediate or Secondary School. For scholars not over 14, the value of the Bursary is 2*l.* 10*s.*, and for scholars over 14, 4*l.*; a maintenance allowance may also be given.

As far as possible, the Bursaries will be equitably distributed over the schools from which applicants are drawn - - - - - - £107

CAITHNESS COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897 - - - - -	559	14	11
„ „ „ „ 19*th March* 1906 - - - -	189	6	10
Contributions by local authorities - - - - -	185	6	5

Scheme approved, 28*th January* 1907.

Allocation of grant :—

I. Subsidies to the following schools, subject in each case to a maximum of seven-eighths of the certified deficiency, and to the condition that candidates must be successfully presented for the Intermediate Certificate :—

	£.
Thurso Miller Institution Higher Grade Public School - - - - - - - - -	80
Wick (Burgh) Pulteneytown Academy Higher Grade Public School - - - - -	80
Latheron, Lybster Higher Grade Public School -	70
Olrig, Castletown Higher Grade Public School -	50
Halkirk Higher Grade Public School - - -	50
Keiss Public School (Provisionally) - - -	40

II. (1) Nine (or ten) Parish Bursaries (three to Latheron, two to Halkirk, one each to Olrig, Dunnet, and Watten, and one to Reay, under certain conditions, and (provisionally) one to an eligible applicant attending Keiss Public School) of 10*l.* each, tenable for two years at an approved Higher Grade School, to scholars in attendance at public or state-aided schools (other than those under Head I.) in the parish to which Bursaries are assigned. Candidates must be qualified in terms of Article 29 of the Code, and under fourteen years of age. No grant is payable where residence from home is unnecessary, but travelling expenses to an amount not exceeding 5*l.* are paid where a pupil resides more than three miles from school.

(2) Ten County Bursaries (four of 5*l.*, two of 7*l.* 10*s.*, and four of 10*l.*) tenable for two years at an approved Higher Grade School by candidates over fourteen and under sixteen in attendance at a Higher Grade School or school with a Secondary Department. The amount of the Bursary varies in each case according to the distance of the school from the pupil's home.

(3) One Technical Bursary of 30*l.*, tenable for three years at Golspie, Sutherland Technical Higher Grade School. Conditions of award similar to those of Parish Bursaries.

III. Premiums of 2*l.* to Head Teachers of schools other than those under Head I., for each candidate obtaining a Bursary under Head II. (1), and thereafter attending a Higher Grade School for at least one year.

IV. Grants not exceeding 5*l.* to rural School Boards towards cost of providing permanent apparatus for teaching technical subjects in Continuation Classes.

V. Nine Bursaries or Maintenance Allowances of not less than 8*l.* or more than 15*l.* to Junior Students.

VI. Expenses of Committee.

CLACKMANNAN COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - - -	538	17	11
„ „ „ „ 19*th March* 1906 - - - -	178	7	4
Contributions by local authorities - - - - - -	13	9	9

Scheme approved on 17*th January* 1907.

Allocation of grant :—

I. Fixed Grants as follows :—

	£
1. To the School Board of Alloa (Burgh) - - - -	200
2. „ „ „ „ „ Alloa (Landward) - - - -	25
3. „ „ „ „ „ Alva - - - - - -	130
4. „ „ „ „ „ Clackmannan - - - - -	25
5. „ „ „ „ „ Tillicoultry - - - - -	40

The sums provided for the School Boards of Clackmannan and Alloa (Landward) to be paid to the School Board of Alloa (Burgh) on condition that pupils from those two districts be admitted to Alloa Academy on the same terms as pupils from Alloa Burgh.

	£
6. To Dollar Institution - - - - - - - - -	100

	£	*s.*	*d.*
II. Bursaries, to Junior Students, of 6*l.* for the first year, and 9*l.* for the second, with fees (not exceeding 5*l.*) and travelling expenses - - - - - - - -	178	0	0
III. Expenses of Committee - - - - - - -	38	10	10

DUMBARTON COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	1,410	3	10
„ „ „ 19*th March* 1906 - - -	636	18	10

Scheme approved, 8*th December* 1906.

Allocation of Grant :—

I. Grants to the following Schools :—

	£
Bonhill, Vale of Leven Academy Higher Grade Public School - - - - - - - -	200
Dumbarton Burgh Academy Higher Grade Public School - - - - - - -	200
Lenzie Academy Higher Grade Public School -	150
New Kilpatrick Higher Grade Public School -	150
Old Kilpatrick, Clydebank Higher Grade Public School - - - - - - - - -	200
Row, Helensburgh Hermitage Higher Grade Public School - - - - - - - -	200

II. (1) Intermediate Bursaries of 2*l.* for each of the first two years and 5*l.* for the third year, open to pupils over 12 who have passed the qualifying examination, and are prepared to enrol in an Intermediate or Secondary School. As far as possible, the Bursaries will be equitably distributed over all the schools in the county.

(2) Secondary Bursaries of 15*l.* per annum, open to pupils who have obtained the Intermediate Certificate; tenable for three years at an Intermediate or Secondary School approved by the Committee, and, in the case of Junior Students (who have first claim on these Bursaries) at a Centre approved by the Department.

Bursars may make a representation with regard to their travelling expenses.

DUMFRIES COUNTY.

	£	s.	d.
Grant for year ended 31st March 1907 :—			
Under the Minute of 10th June 1897 - - - - -	970	16	1
" " " " *19th March 1906* - - - -	405	13	9
Contributions by local authorities - - - - - -	1,092	4	11

Scheme approved, 19th January 1907.

Allocation of grant :—

SECONDARY EDUCATION.

1. The "Selected Schools" are :—Dumfries Academy, Annan Academy Higher Grade Public School, Dryfesdale, Lockerbie Academy Higher Grade Public School, Langholm Academy Higher Grade Public School, Moffat Academy Higher Grade Public School, and Closeburn Wallace Hall Academy.

2. Fixed grant to Dumfries Academy = 200*l.*

3. Grants to the "Selected Schools" in proportion to population and valuation of districts served = 500*l.*

4. Grants to the "Selected Schools" in proportion to the average attendance of scholars qualified in terms of Article 29 of the Code = 500*l.*

5. No grant may exceed three times the amount of the contribution from rates in aid of the advanced department. Part of the grants may be used in support of approved classes under Divisions II., III. and IV. of the Continuation Class Code, but to an extent not exceeding one-fourth of the total expenditure on such classes.

6. Grants towards the provision of science and art apparatus = 50*l.*

7. Building grant on certain conditions to Closeburn Wallace Hall Academy = (balance of 225*l.*).

8. Intermediate Bursaries tenable at schools under Head I.—**A.** Bursaries, &c., under paragraph 8 of previous schemes. **B.** Not more than 40 Bursaries of 2*l.*, to be increased by 5*l.* if student resides over three miles away, and by 15*l.* if residence from home is necessary. Candidates must be not more than 15 years of age.

9. Secondary Bursaries tenable at Dumfries Academy.—**A.** Bursaries, &c., under paragraph 9 of previous schemes. **B.** Not more than 10 Bursaries of 10*l.* to Junior Students and 5*l.* to others (with free education), to be increased by 5*l.* if candidate resides over three miles away, and by 15*l.* when resident from home is necessary. Tenable for not more than three years.

TECHNICAL INSTRUCTION.

10. To the West of Scotland Agricultural College = 150*l.*

11. One Bursary of 25*l.* (and such other Bursaries as the Committee may determine), open to candidates over 16, and tenable for two years at The West of Scotland Agricultural College. Bursar must regularly attend full course of classes that will qualify him to go forward for the national diploma in agriculture.

12. Three Bursaries of 5*l.*, tenable for one year at the West of Scotland Agricultural College. Bursars must attend regularly (*a*) one class in the college or (*b*) the special short course of lectures for farmers, &c., and must pay their own class fees.

13. Allowances of 2s. per day, with class fees and railway fare, to students attending for at least six consecutive days' instruction at Kilmarnock Dairy School.

14. A sum in the Committee's discretion towards the maintenance and instruction of blind youths not under 16 years of age at the Royal Blind Asylum, Edinburgh, or other approved institution.

15. 50*l.* for agricultural experiments, instruction in agriculture, bee-keeping, &c.

16. 125*l.* for expenses of Committee.

DUNDEE BURGH.

Grant for year ended 31*st March* 1907 :— £ *s.* *d.*
Under the Minute of 10*th June* 1897 - - - - 1,911 17 9
„ „ „ „ 19*th March* 1906 - - - - - 900 19 10
Scheme approved, 4*th January* 1907.

Allocation of grant :—

I. Expenses of Committee = 80*l.*

II. To Dundee High School = 1,050*l.*

„ Dundee Morgan Academy Higher Grade Public School
„ „ Harris „ „ „ „ „ } £950.

These grants are conditional upon the provision of certain free places.

III. (**A.**) Intermediate Bursaries, to such number as the funds will allow, open to candidates qualified in terms of Article 29 of the Code, tenable for three years (or until the Intermediate Certificate be obtained), and entitling the holder to free education, &c., at one of the schools under Head II. Maintenance allowances of not more than 5*l.* may be made to the parents of pupils over 14 in specially deserving cases.

(**B.**) Secondary Bursaries, to such number as the funds will allow, open to pupils who hold the Intermediate Certificate, tenable for two years (or until the Leaving Certificate, or an equivalent, be obtained), and entitling the holder to free education, &c., at one of the schools under Head I. Further allowances of 10*l.* to girls and 12*l.* to boys may also be made.

IV. Placed at the disposal of the School Board on behalf of Junior Students = 80*l.*

EDINBURGH CITY.

Grant for year ended 31*st March* 1907 :— £. *s.* *d.*
Under the Minute of 10*th June* 1897 - - - - 3,568 10 5
„ „ „ „ 19*th March* 1906 - - - - 1,772 18 2
Scheme approved, 12*th December* 1906.

Allocation of grant :—

Grants to five Higher Class Schools conditional upon the establishment of free scholarships :—

School.	*No. of Free Scholarships.*	*Amount of Grant.* £
1. To Edinburgh Royal High School - -	40 (for boys)	- 850
2. To Edinburgh George Watson's Boys' College - - - - - - -	24 („ „)	- 200
3. To Edinburgh Daniel Stewart's College	24 („ „)	- 200
5. To Edinburgh Ladies' College - -	52 („ girls)	- 650
6. To Edinburgh George Watson's Ladies' College - - - - - - -	28 („ „)	- 350
4. In connection with the establishment of 40 Scholarships at Edinburgh, George Heriot's School - - - - -		200

7. Towards salaries of teachers, and provision of books, &c., in the following schools :—

		£
Edinburgh Boroughmuir Higher Grade Public School - - - - - - - -	Edinburgh School Board.	635
Edinburgh Broughton Higher Grade Public School - - - - - - - -		
Edinburgh James Gillespie's Higher Grade School - -		210
Edinburgh Church of Scotland Normal Practising Higher Grade School - - - - - - - - -		50
Edinburgh Normal and Model United Free Church Higher Grade School - - - - - - - - -		50

8. To Edinburgh School Board for the provision of Bursaries or Maintenance Allowances for Junior Students and for the preliminary instruction of pupils who have not yet obtained the Intermediate Certificate - - - £1,100

9. Balance to be reserved for similar Bursaries and Allowances to be warded by the Committee.

EDINBURGH COUNTY.

	£	s.	d.
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897 - - - -	1,192	17	2
" " " " 19*th March* 1906 - - - -	522	11	1
Contributions by local authorities - - - - -	1,240	3	6

Secondary and Technical Scheme approved, 14*th December* 1906.

Allocation of grant :—

SECONDARY EDUCATION.

I. (1) 70*l.* to each of the following schools, provided that the grant shall in no case exceed three-fourths of the certified deficiency :—

Colinton, Juniper Green Higher Grade Public School.
Dalkeith (Burgh), King's Park Higher Grade Public School.
Lasswade Higher Grade Public School.
Musselburgh Grammar Higher Grade Public School.
Penicuik Higher Grade Public School.
West Calder Higher Grade Public School.

(2) The above grant to be increased to 75*l.* where admission is given to not less than fifteen qualified scholars not in receipt of Bursaries, whose railway fares are paid by the Committee, and to 80*l.* where twenty or more are admitted.

(3) Travelling Expenses to scholars qualified in terms of Article 29 of the Code to enable them to attend the Schools under Head I. (1).

II. (1) Twelve Intermediate Bursaries, tenable for three sessions, to be awarded by competitive examination to scholars under 13, qualified in terms of Article 29 of the Code, of 1*l.* up to the age of fourteen, 2*l.* at end of session in which Bursar attains fourteen, 5*l.* at end of second session, and 12*l.* at end of third session ; a further sum may be allowed for travelling expenses.

(2) Six Supplementary Bursaries of 1*l.*, which may be increased at the end of the second and third sessions to 3*l.* 10*s.* and 7*l.* 10*s.* respectively, tenable on similar conditions to those for Intermediate Bursaries, on the principle of one Bursary to each school in the county, provided that no Bursary shall be given in the case of schools holding an Intermediate Bursary.

(3) Five County Bursaries of 15*l.*, with travelling expenses, tenable for two sessions, and in exceptional cases for three, by scholars who hold the Intermediate Certificate and who propose to study for the Leaving Certificate or Junior Student Certificate.

III. Capitation grants of 10*s.* and 7*s.* 6*d.* to Head Teachers of Elementary Schools for each Scholar qualified in terms of Article 29 of the Code, transferred to, and remaining for one session at, Higher Grade Schools or Higher Departments.

IV. Bursaries of 10*l.*, with travelling expenses, to fifteen scholars nominated as Junior Students, tenable for two years at the nearest Junior Student Centre, whether in the county or not.

TECHNICAL EDUCATION.	£	s.	d.
I. To Edinburgh and East of Scotland College of Agriculture	400	0	0
" " Heriot-Watt College - - - - -	150	0	0
" The Queen Victoria Jubilee Institute for Nurses -	20	0	0

		£	s.	d
II. Women's Subjects, as follows :—				
Dressmaking - - - - -	about	179	16	6
Cookery and Laundry - - - -	„	176	6	9
Sewing - - - - - - - - -		9	0	0
III. Local Technical Classes as follows :—				
Machine Construction and Drawing, Shorthand - - -		83	19	4
Mathematics, Electricity and Magnetism - - - - -		43	13	4
Agriculture and Veterinary - - - - -		12	2	10
Poultry-keeping - - - - - - - -		5	0	0
IV. Two Scholarships, of 40*l.* each, to mining students tenable at the Day Classes at Edinburgh, Heriot-Watt College. (One half of the cost is contributed by the Scotch Education Department) -		40	0	0
V. Travelling expenses of students at the Evening Classes at Edinburgh, Heriot-Watt College - - -		217	10	11
VI.–VIII. Expenses of Administration, etc. - - -		252	19	8

ELGIN COUNTY.

	£	s.	d.
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897 - - - - - -	672	12	10
„ „ „ 19*th March* 1906 - - - -	248	15	2
Contributions by local authorities - - - - - -	212	10	1

Scheme approved 23*rd January* 1907.

Allocation of grant :—

I.—Secondary Education.

1 (a.) Grants to the following schools, on condition that free secondary education is given to pupils obtaining grants under Head 2 :—

	£
Elgin Academy - - - - - - - -	285
Bellie, Fochabers, Milne's Institution Higher Grade Public School - - - - - -	40
Forres (Burgh) Higher Grade Public School	50
Cromdale, Grantown Higher Grade Public School - - - - - - - -	50
Rothes Higher Grade Public School - - -	20

(b) Grants to Teachers in respect of scholars qualified in terms of Article 29 of the Code who are transferred to a Higher Grade Department, and remain there for a reasonable time.

2. Two Bursaries of 20*l.*, and five of 10*l.*, with free education at the nearest or most convenient centre school, to pupils in certain specified parishes ; two additional Bursaries of 10*l.* to pupils in outlying districts ; and 32 grants of 3*l.*, with free railway ticket and free education, to pupils in various parishes. These privileges will not be continued for more than four years, except in special circumstances.

3. Candidates for admission to centre schools must have passed the Qualifying Examination (Article 29 of the Code), and ordinarily must be under 14 ; selection is made by competitive examination.

II.—Training of Teachers.

(a) Bursaries of 8*l.* each to Junior Students.

(b) „ „ 3*l.* „ „ pupils preparing for the Intermediate Certificate. In each case a further allowance may be given for travelling and other expenses.

III.—Technical Education.

1. To Elgin Victoria School of Science and Art - - - - £80

To each of the first three Higher Grade Schools under Head I., 20*l.* - - - - - - - - - - - £60

2. One Bursary of 20*l.*, tenable at a recognised technical school or college, or at the North or East of England Colleges of Agriculture.

3. Grants to assist Teachers in attending Vacation Courses at home or abroad, in terms of Article 91 (d) of the Code = 10*l.*

FIFE COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897 - - - -	- 2,524	7	9
„ „ „ „ 19*th March* 1906 - - -	- 1,223	7	3
Contributions by local authorities - - - - -	- 2,489	3	7

Secondary and Technical Schemes approved, 6th December 1906.

Allocation of grant :—

SECONDARY EDUCATION.

I. Secondary Schools.—Payment of three-fourths (normally) of the deficiency, exclusive of Committee's grant, to the first two schools named below, and of the whole deficiency to the other three, but not exceeding the following sums :—

	£
Dunfermline High School - - - - -	140
Kirkcaldy High School - - - - -	140
Cupar, Bell Baxter School - - - -	140
Anstruther, Waid Academy - - - -	140
St. Andrews' Madras College - - - -	140

II. Intermediate Schools.—Payment of three-fourths (normally) of the deficiency exclusive of the Committee's grant, but not exceeding the following sums :—

	£
Burntisland (Burgh) Higher Grade Public School	90
Ferryport-on-Craig „ „ „ „	90
Forgan, Newport „ „ „ „	90
Newburgh - - „ „ „ „	90
Scoonie, Leven - - „ „ „ „	90

III. Intermediate Bursaries, of the minimum value of 1*l.* (plus fees, not exceeding 5*l.* a year, to pupils attending a Secondary School) with travelling and maintenance allowances, according to circumstances ; open to pupils qualified in terms of Article 29 of the Code, who have proceeded or are about to proceed to an Intermediate or Secondary School ; and tenable for three years. As far as possible these bursaries will be equitably distributed over the schools from which applicants are drawn = 1,200*l.*

IV. Secondary Bursaries, of the normal value of 10*l.*, but varying according to circumstances ; tenable for three years ; open to Junior Students and to pupils other than Junior Students who have obtained the Intermediate Certificate and who propose to continue their education at a Secondary School or Junior Student Centre = 1,000*l.*

VI. Payments to Head-masters, for each duly qualified pupil who has passed into and intends to remain not less than three years at an approved Secondary or Intermediate School. Preferential treatment to be given to teachers of schools unfavourably situated as regards travelling facilities to nearest Secondary or Intermediate School = 100*l.*

VII. Capitation Grants and County Bursaries under previous scheme.

VIII. Books to scholars in any Higher Class School for whom such assistance seems desirable, if funds permit.

IX. Expenses of Committee = 200*l.*

X. Any unexpended balance to be placed to a Reserve Fund.

TECHNICAL INSTRUCTION.

XIV. (1.) (*a*) Grants for Science, Drawing, or other approved form of Technical Instruction, of not more than 25*l.* nor more than three-fourths of a certified deficiency, to Higher Grade Schools situated in Burghs contributing the whole of their Residue Grant to the County Committee = 150*l.*

(*b*) Grants to School Boards to assist in providing instruction in such subjects as Health Lectures, Cookery, Laundry, and Housewifery, in Supplementary Courses = 100*l.*

(2.) (*a*) Grant to Edinburgh and East of Scotland College of Agriculture = 250*l.*

(*b*) Bursaries to enable young farmers to attend Special Month's Course = 20*l.*

(*c*) Bursaries to enable young women to attend Kilmarnock Dairying Course = 10*l.*

(*d*) Grants for establishing School Gardens, Apparatus, &c. = 20*l.*

(*e*) Grants, Medals, and Certificates for ploughmen = 20*l.*

(*f*) Local expenses and printing = 30*l.*

(3.) Lecture Courses (not under the Continuation Class Code) in :—

	£
(*a*) Health Lectures	100
(*b*) Ambulance	50
(*c*) Scientific Lectures	20
(*d*) Literary Lectures	20

(4.) Specialised subjects under Divisions II. and III. of the Continuation Class Code : –

(*a*) Central Classes under the County Committee=1,400*l.*

(*b*) Classes conducted by Burgh School Boards.—Subsidies not exceeding three-fourths of the deficiency, and determined after consideration of the amount contributed by the Local Town Council, and the provision made under head 4 (*a*) =800*l.*

(*c*) Classes conducted by Parish School Boards.—Sums equal to three-fourths of the deficiency, but not exceeding 10*l.* for any one school = 200*l.*

For subjects under Divisions I. and IV. of the Continuation Class Code :—

(*d*) To Parish School Boards, for rural classes, grants not exceeding 3*l.* on condition that provision is made for higher instruction under Divisions II. or III.= 50*l.*

(5.) Teachers' Classes = 250*l.*

(6.) (*a*) Junior Scholarships (Article 79 (*a*) Continuation Class Code) of 10*s.* to 5*l.* each, which may be increased from 1*l.* to 10*l.* by the Department, tenable for one year or longer = 50*l.*

(*b*) Three Senior Scholarships (Article 79 (*b*) Continuation Class Code) of 25*l.* per annum, which may be increased to 50*l.* by the Department, open only to students at classes under the Committee, and tenable for three years = 75*l.*

(*c*) Towards travelling expenses of students at Central Classes = 25*l.*

(*d*) Prizes for Committee's Central Classes = 10*l.*

(7.) Expenses of Administration = 560*l.*

FORFAR COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	1,505	9	4
„ „ „ „ 19*th March* 1906 - - - -	687	1	8

Scheme approved, 22*nd December* 1906.

Allocation of grant :—

		£
I.	To Arbroath High School - - - - - - - -	300
	„ Brechin High School - - - - - - - -	300
	„ Forfar Academy - - - - - - - - -	300
	„ Montrose Academy - - - - - - - -	300
II.	„ Broughty Ferry, Grove Academy Higher Grade Public School - - - - - - - - - -	230
	„ Kirriemuir, Webster's Seminary Higher Grade Public School - - - - - - - - - -	165

The payment of the above grants is conditional upon the provision of Free Scholarships for the Bursars appointed by the Committee.

III. (**A**) Intermediate Bursaries, entitling the holders to Free Education at an approved Higher Grade or Secondary School, open to pupils qualified in terms of Article 29 of the Code, who are prepared to continue at school for at least three years or until the Intermediate Certificate is obtained. Pupils over 14 whose parents are in necessitous circumstances may also receive a maintenance allowance of not more than 5*l.* a year.

(**B**) Secondary Bursaries, entitling the holders to Free Education at an approved Higher Grade or Secondary School and to an allowance in the Committee's discretion of 12*l.* to girls and 15*l.* to boys ; open to pupils in attendance at a Secondary or Higher Grade School who have obtained the Intermediate Certificate ; and tenable for not more than three years.

IV. Capitation Grants.—State-aided day schools in the county (except those in Dundee, Arbroath, Brechin, Forfar, Montrose, Broughton Ferry, and Kirriemuir) may receive 1*l.* for each scholar who qualifies in terms of Article 29 of the Code and completes a first year's course in a recognised Higher Grade or Secondary School ; but no one school may receive more than 5*l.*

VII. Expenses of Committee = 70*l.*

GLASGOW BURGH.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	6,822	1	0
„ „ „ „ 19*th March* 1906 - - - -	3,485	5	10

Scheme approved on 13*th December* 1906.

Allocation of grant :—

I. Grants to the following schools, conditional upon the provision of free scholarships for specified numbers of scholars who have previously attended State-aided schools in the school board district of Glasgow :—

	No. of free scholarships.	£
Glasgow High School (boys) - - - - -	60	1,600
„ „ „ for Girls - - - -	60	880
„ Hutchesons' Grammar Schools - - (boys and girls jointly)	48	600
„ Allan Glen's School (boys) - - - - -	42	600
„ St. Aloysius' College (boys) - - - -	30	250
„ St. Mungo's Academy, Higher Grade Roman Catholic School (boys) -		250
„ Our Lady and St. Francis' Higher Grade Roman Catholic School (girls)- -		200
Govan Dowanhill Roman Catholic Practising Higher Grade School (girls) - -	30	50

Glasgow, John Street, Bridgeton Higher Grade Public School	No. of free scholarships.	
„ Kent Road Higher Grade Public School	150 (boys and girls)	£ 1,950
„ Provanside „ „ „ „		
„ Whitehill „ „ „ „		
„ Woodside „ „ „ „		
Continuation Classes for higher instruction under the School Board		340
To Glasgow Athenæum Commercial College		150

II. Bursaries for Junior Students (boys 17*l.* 10*s.*, girls 15*l.*), and for pupils preparing for the Intermediate Certificate (boys 12*l.*, girls 10*l.*), allocated as follows :—

	£.
Candidates nominated by the School Board of Glasgow	1,250
Candidates from Voluntary Schools, nominated by the Committee	750

III. Balance of 1,483*l.* 12*s.* 9*d.*, subject to expenses of Committee, to be carried forward to next year.

GOVAN PARISH.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897	2,409	16	3
„ „ „ „ 19*th March* 1906	1,163	1	2
Contributions by local authorities	400	0	0

Scheme approved 6*th November* 1906.

Allocation of grant :—

A. Expenses of Committee.

B. Grants to the following schools, on condition that 240 scholarships are provided in the first four, and twelve in the last one, the other two being free schools :—

	£.
Govan Hillhead School	600
„ Pollokshields, Albert Road Higher Grade Public School	335
„ Bellahouston Academy „ „ „ „	380
„ Partick, Hamilton Crescent „ „ „ „	370
„ Strathbungo Higher Grade Public School	320
„ Fairfield „ „ „ „	325
„ Dowanhill Roman Catholic Practising Higher Grade School	200

C. To Roman Catholic Schools (for this year only). Towards the cost of fees and books for scholars who have already proceeded to the higher departments of certain specified schools — 150

D. To Govan Parish School Board for promotion of Secondary Education under the Continuation Class Code — 120

E. (1). To Govan Parish School Board a sum sufficient to provide a limited number of (*a*) Secondary Bursaries, of 17*l.* 10*s.* for boys and 15*l.* for Girls, open to scholars who have obtained the Intermediate Certificate and are continuing their education at a recognised central school, and (*b*) Intermediate Bursaries of the minimum value of 5*l.* open to scholars who, having passed the qualifying examination, are preparing for the award of the Intermediate Certificate. Junior Students have first claim on the Secondary Bursaries.

(2). Committee to provide similar bursaries for a limited number of scholars from Voluntary Schools in the parish.

HADDINGTON COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897	610	13	6
„ „ „ „ 19*th March* 1906	216	2	11
Contributions by local authorities	64	9	11

Scheme approved, 17*th January* 1907.

Allocation of grant :—

A. Secondary Education. £.

1. (a). To Haddington Knox Institute - 100
„ North Berwick High School - 100
(b). „ Dunbar (Burgh) Higher Grade Public School - 40

2. Secondary Bursaries, of amounts dependent on expenditure incurred on travelling, maintenance, books or fees, open to pupils holding the Intermediate Certificate, and tenable for not more than three years or until the Leaving Certificate or Junior Student Certificate is obtained - 112

3. (a). A Bursary of 5*l.* for not more than one year to scholars who, having qualified in terms of Article 29 of the Code at any State-aided schools other than those receiving a slump grant, attend a Higher Class or Higher Grade School in the County. (To be superseded after this year by Section (3) c.)

(b). Towards travelling expenses of holders of last year's Bursaries - £. 60

(c). Intermediate Bursaries of amounts calculated on the same principles as the Secondary Bursaries, tenable by pupils qualified in terms of Article 29 of the Code who intend to study for the Intermediate Certificate, at any school with a curriculum approved for that purpose - 280

Expenses of Committee - 30

B. Technical Education. £ *s.* *d.*

To North Berwick High School for physical laboratory apparatus and teachers' salaries (including sum voted last year and interest) - 68 2 3

INVERNESS COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897	1,156	14	5
„ „ „ „ 19*th March* 1906	503	10	9
Contributions by local authorities	311	5	7

Scheme approved 8*th December* 1906.

Allocation of grant :—

I.—Secondary Education.

A. Bursaries :—

I. Intermediate Bursaries, awarded as far as possible on the principle of one Bursary to each Primary School, tenable for three years at schools recognised as qualified to prepare for the Intermediate Certificate. A limited number, of a minimum value of 3*l.*, are open to pupils who have attended an Intermediate or Secondary School for at least one year, and who are fourteen years of age. Applicants from Primary Schools must have attended thereat for at least one year, must be between 12 and 15 years of age, and must have passed the Qualifying Examiation (Art. 29 of the Code); the value of the Bursary for the first year in these cases is not less than 3*l.*, or, where continuous residence from home is involved, not less than 15*l.* Payment of travelling expenses may also be made where necessary, and a premium may be paid to the teacher for each successful pupil.

II. Secondary Bursaries open to pupils (with a preference to Junior Students) who, having gained the Intermediate Certificate, proceed to or continue at schools recognised as qualified to prepare for the full Leaving Certificate, of the maximum value of 20*l.* where continuous residence from home is necessary, and in other cases, of amounts determined by the particular circumstances of each case.

B. Subsidies to Intermediate and Secondary Schools :—

(**a**) To Inverness Royal Academy, on condition that free education be given to the Committee's Bursars = 100*l.*

(**b**) A commuted and inclusive payment of 50*l.* to each of the following schools :—

Kilmallie, Fort William Higher Grade Public School.
Kingussie Higher Grade Public School.
Portree " " " "
Urquhart, &c., Glen Urquhart Higher Grade Public School.

Expenses of Committee = 90*l.*

II.—Technical Education.

A. Bursaries under previous schemes.

B. Courses for the further instruction of Pupil Teachers (under the Continuation Class Code).

C. Special Grant of 75*l.* to Inverness (Burgh) High Higher Grade Public School, on condition that the School, with its Technical and Science Staff and equipment be available to County Pupils or Teachers.

D. A grant of 50*l.* to Aberdeen and North of Scotland Agricultural College.

The Committee reserve the liberty to subsidise, with the Department's sanction, any other recognised branch of Technical Education.

KINCARDINE COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897 - - - -	534	19	4
" " 19*th March* 1906 - - - -	176	6	0
Contributions by local authorities - - - - - -	241	1	0

Scheme approved, 28*th January* 1907.

Allocation of grant :—

	£
1. To Stonehaven Mackie Academy, conditional upon the provision of ten free places - - - - - - - - - - -	360
2. To Montrose Academy, conditional upon the provision of six free places - - - - - - - - - - -	60
3. To Banchory Ternan Central Public School, to assist in obtaining Higher Grade recognition - - - - - - - -	60

4. (**1**) Secondary Bursaries, open to pupils who, having obtained the Intermediate Certificate, desire to continue their education at a Secondary School, and tenable for three years (or until the Leaving Certificate or Junior Student Certificate is obtained) at a school approved by the Department in the case of Junior Students, and at any Secondary School in the county or within four miles thereof in the case of other pupils.

(**2**) Intermediate Bursaries tenable, as a rule for three years, open to pupils who are, ordinarily, under 13 and who, having qualified in terms of Article 29 of the Code, desire to proceed to an Intermediate or Secondary School to obtain the Intermediate Certificate.

As far as possible, the Bursaries will be distributed over the parishes from which applicants are drawn, on the principle of one Bursary to a Parish.

5. A sum of 15*s.* for teachers, on account of each pupil passing into and remaining at least one year at a school in which Bursaries under Head 4 (2) may be held.

6. For travelling expenses of teachers obtaining a diploma after a course of instruction under Article 55 of the Regulations for the Preliminary Education, &c., of Teachers = 40*l.*

7. To schools other than those under Heads 1 to 3, for classes under the Continuation Class Code, under certain conditions, a grant of 3*s.* 4*d.* for theoretical, and 6*s.* 8*d.* for practical instruction per pupil per hour per week, for a minimum session of 15 weeks.

8. Balance, subject to expenses of Committee, to remain in hand for future application.

KINROSS COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - - -	275	10	2
" " " " 19*th March* 1906 - - -	39	14	10

Scheme approved, 30*th January* 1907.

Allocation of grant :—

A. Intermediate Bursaries, of amounts varying according to the circumstances of each case, but not exceeding 3*l.* for the first two years and 5*l.* for the third, in addition to school fees and travelling expenses; open to candidates who have passed the Qualifying Examination (preference being given to those who pass between 12 and 13) and who intend to enter an approved school to study for the Intermediate Certificate. The Bursaries will be awarded as far as possible on the principle of one Bursary to each school with a qualified Candidate.

B. Secondary Bursaries, awarded by methods similar to those for the Intermediate Bursaries, of amounts not exceeding 8*l.* for the first year, 9*l.* for the second, and 10*l.* for the third, in addition to fees and travelling expenses, and tenable for two years, with an extension of one year if necessary, at approved schools, by pupils nominated as Junior Students, and others who have obtained the Intermediate Certificate or similar qualification.

KIRKCUDBRIGHT COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - - -	619	13	3
" " " 19*th March* 1906 - - - -	220	17	6
Contributions by local authorities - - - - - -	310	1	5

Scheme approved, 15*th January* 1907.

Allocation of grant :—

I.—Secondary Education Funds.

3. The grants to schools are conditional upon the provision of free education in terms of section 2 of Head 8 below.

	£
4. To Kirkcudbright Academy - - - - - - - -	200
5. To Dumfries Academy - - - - - - - - -	90
To Newton Stewart, Ewart and Douglas High Schools - -	45

6. Payment of fees to the above three schools on account of the Committee's Bursars in excess of 20 at Kirkcudbright Academy, 12 at Dumfries Academy, and 6 at Newton Stewart, Ewart and Douglas High Schools.

	£
7. To Kelton, Castle-Douglas Higher Grade Public School - -	90
To Urr, Dalbeattie " " " " - -	90

8. (1) (*a*) Secondary Bursaries, of not less than 10*l.*, and (*b*) Intermediate Bursaries, of not less than 5*l.*, but these amounts may be increased in special circumstances.

(2) Free Places, as follows :—12 at Kirkcudbright Academy, 8 at Dumfries Academy, and 4 at the Ewart and Douglas High Schools. The Bursaries and Free Places to be equitably distributed over the schools having qualified applicants = (about) 300*l.*

9. (1) Secondary Bursaries are open only to Candidates who hold the Intermediate Certificate, and who agree to follow either an approved Junior Student Course, or a curriculum leading up to the leaving certificate, preference to be given to the claims of Junior Students.

Intermediate Bursaries and Free Places are open to pupils, not over 13, who agree to study for the Intermediate Certificate; for the former, pupils must reside more, and for the latter less, than four miles from one of the schools under Heads 4, 5 and 7.

(2) Bursaries and Free Places are tenable for three years, or until the award of the certificate aimed at in each case, and in addition to the Bursary will entitle the holder (*a*) of a Secondary Bursary to free education at an approved centre; (*b*) of an Intermediate Bursary to free secondary and technical education according to the curriculum of the school attended, and (*c*) of a Free Place to free secondary and technical education according to the curriculum of the school in which the Free Place is held.

II.—Technical Education Funds.

11. From the contribution by the County Council :— £.

To Kelton, Castle Douglas Higher Grade Public School	70
To Urr, Dalbeattie " " " "	70
To Kirkcudbright Academy - - - - -	60

12. Towards Bursaries under Head 8 - - - - - 60

13. Grants handed over by the Burgh of Kirkcudbright, and by the Town Councils of Castle Douglas and Maxwelltown, to be paid to the following schools respectively :—

	£	*s.*	*d.*
Kirkcudbright Academy - - - - -	20	1	5
Kelton Castle Douglas Higher Grade Public School - - - - - - - -	20	0	0
Dumfries Academy - - - - - -	10	0	0
Expenses of Committee - - - - - -	40	0	0

LANARK COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	5,333	5	2
" " " " 19*th March* 1906 - - - -	2,701	14	4

Scheme approved 16*th October* 1906.

Allocation of grant :— £.

(a) Expenses of Committee - - - - - - - - -	150
(b) Special grant to Hamilton Academy - - - - -	200
(c) Additional fixed grant to Hamilton Academy - - - - -	450
(d) Capitation Grants, ordinarily of 2*l.* 2*s.* per pupil (but not exceeding three-fourths of the certified deficiency) on the average attendance of pupils who have passed the Qualifying Examination, to the following schools - - - - - -	3,387

Airdrie Academy Higher Grade Public School.
Avondale, Strathaven Academy Higher Grade Public School.
Biggar High Higher Grade Public School.
Bothwell, Bellshill Academy Higher Grade Public School.
Bothwell, Elmwood Convent Higher Grade Roman Catholic School.
Bothwell, Uddingston Grammar Higher Grade Public School.
Cambuslang, West Coats Higher Grade Public School.
Cambusnethan, Wishaw Higher Grade Public School.
Carluke Higher Grade Public School.
Dalziel High Higher Grade Public School.
Dalziel, Motherwell Higher Grade Roman Catholic School.
Hamilton (Landward), Low Waters Higher Grade Public School.
Lanark (Burgh) Grammar Higher Grade Public School.
Larkhall Academy Higher Grade Public School.
Lesmahagow Senior Higher Grade Public School.

Maryhill, North Kelvinside Higher Grade Public School.
Old Monkland, Coatbridge Higher Grade Public School.
Shettleston, Eastbank Higher Grade Public School.
Springburn Higher Grade Public School.

Lenzie Academy Higher Grade Public School
(In respect of pupils from Lanarkshire).

Fee-paying schools must provide free places, to be at the disposal of the Committee, at the rate of one for every 10*l.* of grant obtained.

(e) A Grant of 1*l.* 10*s.* to the headmaster of any non-central school, for each pupil who has passed the Qualifying Examination, and has completed one year in an approved Secondary Department = 600*l.*

(f) Payments to Bursars under former schemes = 670*l.*

(g) **1.** Secondary Bursaries, of the minimum value of 10*l.*, open to pupils who, having obtained the Intermediate Certificate, propose to continue their education at a Secondary School. Junior students have first claim on these Bursaries.

2. Intermediate Bursaries, of the minimum value of 5*l.*, open to pupils who, having passed the Qualifying Examination, have proceeded or are about to proceed to an Intermediate or Secondary School to study for the Intermediate Certificate; preference given to pupils whose attendance at a central school will involve outlay on travelling or maintenance; other pupils must be over 14.

Bursaries will be equitably distributed, as far as possible, over the schools from which applicants are drawn.

LEITH BURGH.

Grant for year ended 31*st March* 1907:—

	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	1,022	10	3
„ „ „ „ 19*th March* 1906 - - - -	432	18	0

Scheme approved, 13*th December* 1906.

Allocation of grant:—

I. To Leith Academy Higher Grade Public School - -	476	0	0
„ „ Trinity Academy Higher Grade Public School	176	0	0
II. Two silver medals to the boy and girl obtaining the highest marks in the third year's course at the schools under Head I. - - - - - - - - -	4	5	0
III. Bursaries, as follows, at the schools under Head I.	638	0	0

Division I.—Twenty-five Intermediate Bursaries, of 2*l.* for each of the first two years, and of 5*l.* for the third, tenable by pupils over 13 years of age qualified in terms of Article 29 of the Code, at one of the schools under Head I. One bursary to be awarded to each school with a qualified applicant in the first place, and thereafter, bursaries to the pupils with the next best records according to the number of applicants from each school.

Division II.—Secondary Bursaries of 8*l.* for the first year, 10*l.* for the second, and 12*l.* for the third in the case of Girls; and of 10*l.* for the first year, 12*l.* for the second, and 15*l.* for the third, in the case of Boys; open to pupils who hold the Intermediate Certificate, and tenable for one, two or three years, according to the Course to be followed.

Of the total of 638*l.* under this Head, 300*l.* or thereabouts to be paid over to the School Board of Leith as required by the Regulations for the Preliminary Education, &c., of Teachers.

IV. To Leith Technical College:—

(a). 50*l.* towards salaries of teachers giving instruction under the Continuation Class Code.

(b). 50*l.* for bursaries, under a special scheme, of amounts ranging from 10*s.* to 2*l.*, and carrying exemption from the payment of fees for the following session.

V. Expenses of Committee = 41*l.* 3*s.* 3*d*

LINLITHGOW COUNTY.

	£	*s*	*d.*
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897 - - -	905	14	4
„ „ „ „ 19*th March* 1906 - - -	371	8	7
Contributions by local authorities - - - -	771	8	1

Secondary and Technical Schemes approved, 10th *January*, 1907.

Allocation of grant :—

SECONDARY EDUCATION

	£.
A. (*a*) To Linlithgow Academy - - - - - - -	200

(*b*) One half the certified deficiency, but not exceeding the following amounts, to :—

	£.
Bathgate (Town) Academy Higher Grade School -	180
Bo'ness Academy Higher Grade Public School - -	180

B. (*a*) Secondary Bursaries, of amounts determined by the circumstances of the parents and by the distance of home from school, tenable at an approved school for three years, or until the award of the Leaving Certificate or Junior Student Certificate. Intermediate Bursaries of amounts dependent on circumstances as in the case of Secondary Bursaries, to pupils under 14, tenable for three years, or until the award of the Intermediate Certificate ; and travelling, maintenance, or other expenses of Bursars - - - - - - - - - - 600

(*b*) Expenses of Committee - - - - - - - - 120

C. From any balance, further grants to the schools under Head A, in proportion to their certified deficiencies.

TECHNICAL EDUCATION.

I. Special Technical Classes :—

(*a*) Classes conducted by the Committee in Mining, Building Construction, Machine Construction, Shorthand and Practical Mathematics, for a course of three years, and in Cookery, at Bo'ness, Linlithgow, Bathgate, Broxburn, Fauldhouse and Livingston and a Day Class in Drawing for Pupil Teachers at Bathgate.

Students, excepting Pupil Teachers, living three miles or more from place where Classes are held may be allowed their railway fares, subject to certificates of regular attendance and satisfactory progress.

(*b*) Subject to certificates of regular attendance, students who have satisfactorily attended for three sessions the classes under Head I (*a*) may be allowed fares to enable them to attend more advanced classes outside the County.

(*c*) To the Edinburgh and East of Scotland College of Agriculture :—

	£.
For Experiments and Classes - - -	100
„ Building (Balance of 100*l.*) - - -	50

II. The grants to students from a Burgh retaining any portion of its Residue Grant, to be reduced by the amount so retained.

NAIRN COUNTY.

Grant for year ended 31*st March* 1907 :— £ *s. d.*

Under the Minute of 10*th June* 1897 - - - - - 292 12 7

" " " " 19*th March* 1906 - - - - 48 15 1

Scheme approved 23*rd January* 1907.

Allocation of grant :—

1. Second half of existing 16*l.* Bursary.

2. Instalment of Bursary of 30*l.* awarded under scheme for 1901–2, tenable for four years at a Secondary School.

3. The ordinary school fees at the school named under Head 4 to be paid for pupils not over 13 years of age who have passed the qualifying examination (Article 29 of the Code).

4. Balance, subject to expenses of Committee, to Nairn, Rose's Academical Institution, under certain conditions.

I. Junior Students.—Payment of fees, a grant of 6*l.*, and travelling or other allowances in particular circumstances, for three students nominated by the Committee.

II. Pupils preparing for the Intermediate Certificate.—Payment of fees and a grant of 2*l.*, with travelling and other allowances in certain cases, for one student from each of five specified parishes, and two students from the Burgh of Nairn. Ordinarily, pupils must be over 12 and under 16 years of age, and no grant is payable to pupils under 14 residing within convenient distance of an Intermediate School.

ORKNEY COUNTY.

Grant for year ended 31*st March*, 1907 :— £ *s. d*

Under the Minute of 10*th June* 1897 - - - - 504 16 6

" " " " 19*th March* 1906 - - - - 160 8 8

Scheme approved, 19*th December* 1906.

Allocation of grant :— £.

1. Expenses of Committee - - - - - - - - 45

2. To Kirkwall (Burgh) Higher Grade Public School - - 160

" Stromness " " " " - - - 90

These grants are conditional upon the provision of free education for the Committee's Bursars, etc.

3. Maintenance Allowances (after providing for Bursaries under previous Schemes) for—

(1) (*a*) Junior Students, and (*b*) Pupils other than Junior Students, who propose to study for the Leaving Certificate.

(2) Candidates for the Intermediate Certificate who are over 12 years of age, have passed the qualifying examination, and are attending approved Centres. Where pupils are under 14, allowances will be payable only in cases where attendance at the Centre involves outlay on travelling and maintenance, etc.

PEEBLES COUNTY.

Grant for year ended 31*st March* 1907 :— £ *s. d.*

Under the Minute of 10*th June* 1897 - - - - 359 13 8

" " " " 19*th March* 1906 - - - - 84 0 11

Scheme approved, 18*th February* 1907.

Allocation of grant :—

I. Secondary and Intermediate Bursaries, which may be sufficient to defray—(1) All fees ; (2) Reasonable travelling expenses ; and (3) Maintenance allowances when necessary, awarded as far as possible on the principle of one bursary to each parish with a qualified applicant = 84*l.* 0*s.* 11*d.*

Intermediate Bursaries are tenable for three years, or until the Intermediate Certificate is obtained, by pupils at least 12 years of age, qualified in terms of Article 29 of the Code. Pupils residing within three miles from school are entitled to school fees only (if any).

Secondary Bursaries are tenable for three years at an approved school, or until the Leaving Certificate (or Junior Student Certificate) has been obtained, by pupils who hold the Intermediate Certificate; certain of these bursaries to be reserved for Junior Students.

II. Balance, subject to expenses of Committee, to Peebles Burgh and County High School.

PERTH COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	1,512	4	7
„ „ 19*th March* 1906 - - - -	690	13	0

Scheme approved 10*th December* 1906.

Allocation of grant :—

I. Secondary Schools—1,200*l.* to be allocated as follows :—

(1.) Three-fourths of the certified deficiency in the first two cases, and the whole in the last two, but not exceeding the following sums :—

	£.
Perth Academy - - - - - - - -	480
Callander, McLaren High School - - - -	130
Perth, Sharp's Institution - - - - - -	230
Crieff, Morrison's Academy - - - - -	230

(2.) The balance to be allocated amongst these schools after consideration of the efficiency of each.

II. Intermediate Schools.—250*l.* to be allocated as follows :—

(1.) Three-fourths of the certified deficiency, but not exceeding the following sums, to :—

	£.
Blairgowrie Higher Grade Public School - - -	90
Dull, Aberfeldy „ „ „ „ - - -	65
Moulin, Pitlochry „ „ „ „ - - -	65

(2.) The balance to be allocated amongst the three schools, after consideration of the efficiency of each.

IV. Expenses of Committee - - - - - - (about) £50.

V. A. Secondary Bursaries, not exceeding 12*l.* each, open to pupils qualified for the Intermediate Certificate, and tenable for not more than three years, ceasing when the holder has obtained the Leaving Certificate. Allowances may also be given, determined by the circumstances of each case.

B. Intermediate Bursaries, of 2*l.* for the first year, 5*l.* for the second, and 8*l.* for the third, to enable pupils who are 12 years of age and have passed the Qualifying Examination (Article 29 of Code) to proceed to or continue at an Intermediate or Secondary School, and tenable for not more than three years; ceasing when the holder has qualified for the Intermediate Certificate. Allowances may also be given, determined by the circumstances of each case.

RENFREW COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	3,314	2	3
„ „ „ „ 19*th March* 1906 - - - -	1,639	0	1

Scheme approved 1*st January* 1907.

Allocation of grant :—

I. Payment of three-fourths of the certified efficiency, but not exceeding the following sums, to :—

	£
1. Paisley Grammar School and Wm. B. Barbour Academy	400
Greenock Academy - - - - - - - -	400

	£.
2. Cathcart, Queen's Park Higher Grade Public School	350
Eastwood, Shawland's Academy „ „	200
Greenock (Burgh), Holmscroft „ „	350
Neilston, Barrhead „ „	120
Paisley (Burgh), Camphill „ „	200
„ „ John Neilson Institution Higher Grade Public School	200
Port Glasgow, Jean Street Higher Grade Public School	90

II. County Bursaries as follows :—

1. Secondary Bursaries of not less than 5*l.*, in such numbers as the funds may allow, tenable for two or three years by pupils who hold the Intermediate Certificate, to enable them to attend an approved Secondary or Higher Grade School with a view to obtaining the Leaving Certificate. In the case of Junior Students, studying for the Junior Student Certificate, these Bursaries may be increased by a maintenance grant of 9*l.* for males and 7*l.* for females.

2. Intermediate Bursaries, in such numbers as the funds may allow, to pupils who have passed the Qualifying (or an equivalent) Examination (Article 29 of Code), entitling the holder to free education for three years, or until the Intermediate Examination is passed, at a Higher Grade School, or in certain approved cases at a selected Secondary School. Intermediate Bursars, as well as a limited number of other pupils, entering on the third year of an Intermediate Course may receive a Bursary of 5*l.* for that year.

The school fees of Bursars, to an amount not exceeding 6*l.* per annum in each case, will be paid by the Committee when necessary, and the necessary travelling expenses of Bursars residing more than two miles from School. Special consideration to be given to Junior Students.

ROSS AND CROMARTY COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897 - - - -	1,012	0	1
„ „ „ 19*th March* 1906 - - - -	427	7	5
Contributions by local authorities - - - - - -	377	6	10

Scheme approved 22*nd December* 1906.

Allocation of grant :—

I.—Secondary Education.

A. Bursaries :—

I. Intermediate Bursaries, awarded as far as possible on the principle of one Bursary to each Primary School, tenable for at least three years, at a School recognised as qualified to prepare for the Intermediate Certificate. A limited number, of a minimum value of 3*l.*, are open to pupils who have attended any of the Schools under Head B. for at least one year, and who are 14 years of age. Applicants from Primary Schools must have attended thereat for at least one year, must be between 12 and 15 years of age, and must have passed the Qualifying Examination (Article 29 I. of the Code); the value of the Bursary for the first year in these cases is not less than 3*l.*, or, where continuous residence from home is necessary, not less than 15*l.* Necessary travelling expenses may also be paid, and a premium may be paid to the teacher for each successful pupil.

II. Secondary Bursaries, open to pupils (with a preference to Junior Students) who, having gained the Intermediate Certificate, proceed to or continue at schools recognised as qualified to prepare for the full Leaving Certificate, of the maximum value of 20*l.* where continuous residence from home is necessary, and in other cases, of amounts determined by the particular circumstances of each case.

B. Subsidies to Intermediate and Secondary Schools for Bursaries, additional Teaching Staff, &c. :—

	£
1. Tain Royal Academy	100
2. Rosskeen, Invergordon Academy Higher Grade Public School	67
3. Dingwall Academy Higher Grade Public School	107
4. Lochbroom, Ullapool „ „ „ „	40
5. Rosemarkie, Fortrose Academy Higher Grade Public School	47
6. Cromarty Higher Grade Public School	34
7. Lochalsh, Plockton Higher Grade Public School	40
8. Stornoway, Nicolson Institute Higher Grade Public School	180
C. Expenses of Committee	45

II.—Technical Education.

I. Courses for the further instruction of Pupil Teachers (under the Continuation Class Code).

II. Special Grants, under certain conditions, towards cost of Special Staff for Technical Instruction :—

	£
Tain Royal Academy	70
Dingwall Academy Higher Grade Public School	70
Stornoway, Nicolson Institute Higher Grade Public School	70
Rosskeen, Invergordon Academy Higher Grade Public School	45
Rosemarkie, Fortrose Academy Higher Grade Public School	20

III. Two Bursaries, to be awarded every third year, of 25*l.* each, tenable for three years at any recognised Agricultural or Technical College.

The Committee reserve the liberty to subsidise, with the Department's sanction, any other recognised branch of Technical Education.

ROXBURGH COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897	715	2	9
„ „ „ „ 19*th March* 1906	271	2	6
Contributions by local authorities	579	12	1

Scheme approved 10*th January* 1907.

Allocation of grant :—

Secondary Education.

I. *General Scheme.*

	£.
1. Expenses of Committee	40
2. Fixed subsidies as follows :—	
(*a*) Kelso High School	270
(*b*) Hawick, Teviot Grove Academy, provided satisfactory proposals be submitted for the future of the School	150
3. To Jedburgh (Burgh) Grammar Higher Grade Public School	70

4. To Melrose Public School, a capitation grant (not to exceed 20*l.* in all) of 3*l.* for each scholar, qualified in terms of Article 29 of the Code, in average attendance, who receives secondary instruction.

5. Travelling allowance for teacher attending classes under Article 91 (*d*) of the Code = 3*l.*

6. Grants and subsidies to be subject to conditions laid down in Department's Minute of 10th June 1897.

7. Any surplus on this part of the scheme to be given to the Higher Class Schools at Kelso and Hawick, and to Jedburgh (Burgh) Grammar Higher Grade Public School, in proportion to the fixed subsidies payable under Heads 2 and 3 above.

II. *Bursary Scheme.*

1. Expenses of Committee = 15*l.*

2. Travelling grants to scholars attending the schools under Heads 2 and 3 of Part I. = 60*l.*

3. Payment of 3*l.* each for twenty-one Free Scholarships, entitling Candidates qualified in terms of Article 29 of the Code to free education at Kelso High School = 63*l.*

4. Intermediate and Secondary Bursaries, of amounts to be determined by the Committee, and intended to cover (*a*) all fees, (*b*) reasonable travelling expenses, and (*c*) maintenance allowances when necessary = 150*l.*

Intermediate Bursaries are open to pupils of at least 12 years of age, qualified in terms of Article 29 of the Code, who undertake to carry out the three years' curriculum which would entitle them to the award of the Intermediate Certificate. In the case of pupils residing within three miles of the approved school, the school fees only (if any) are payable.

Secondary Bursaries are tenable for three years by pupils who hold the Intermediate Certificate, and who undertake to enter on a curriculum leading up to Leaving Certificate, at an approved School.

As far as possible, the Bursaries to be awarded on the principle of one Bursary to each School with a qualified applicant.

Pupil teachers desiring to cancel their apprenticeship may apply for assistance to attend an approved School with the view of obtaining the Intermediate Certificate, and eventually becoming Junior Students.

TECHNICAL EDUCATION.

	£.
1. (*a*) To Kelso High School - - - - - - - -	250
(*b*) „ Hawick, Teviot Grove Academy - - - - -	125
(*c*) „ Jedburgh (Burgh) Grammar Higher Grade Public School	50
2. To the Edinburgh and East of Scotland College of Agriculture	150

3. Balance to be divided between the three Schools under Head 1, in proportion to the fixed subsidies payable thereunder.

N.B.—All the grants to Hawick Teviot Grove Academy are subject to satisfactory settlement of the question of the status of the School.

SELKIRK COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	448	8	3
„ „ „ „ 19*th March* 1906 - - -	130	14	11

Scheme approved, 28*th January* 1907.

Allocation of grant :—

(1). To Yarrow Public School, a grant equal to one-half of such extra expense as shall be shown by its accounts to have been incurred in maintaining an advanced department, said grant not to exceed 25*l.*

	£	*s.*	*d.*
(2). Bursaries under previous schemes - - - -	72	0	0
Four Secondary Bursaries to Junior Students - -	67	10	0
Allowance to two Pupil Teachers - - - - -	15	0	0
Sum carried to Bursary Fund - - - - -	48	4	11
(3). Subject to Expenses of Committee, one-third of the balance to go to Selkirk High School, and two-thirds to Galashiels Academy - - - - - - -	351	8	

Bursaries are of two kinds—Intermediate and Secondary—and are intended to cover fees, and travelling and maintenance expenses, the amounts being determined by the Committee in each case. Intermediate Bursaries are open to pupils qualified in terms of Article 29 of the Code who are at least 12 years of age, who undertake to carry out the three years' curriculum which would entitle them to the Intermediate Certificate, at a school approved for the purpose, and who reside over three miles from the approved school.

Secondary Bursaries are open to pupils who hold the Intermediate Certificate and undertake to enter on a curriculum leading up to the Leaving Certificate at an approved school; certain of these Bursaries are reserved for Junior Students.

Bursaries to be awarded as far as possible on the principle of one Bursary to each school with a qualified applicant. For this year, pupil teachers desiring to terminate their apprenticeship may apply for assistance to attend an approved school with the view of obtaining the Intermediate Certificate and eventually becoming Junior Students.

SHETLAND COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897	499	3	3
„ „ „ „ 19*th March* 1906	157	9	1

Scheme approved, 12*th March* 1907.

Allocation of grant :—

I. Bursaries for (*a*) Intermediate Students, and (*b*) Junior Students and Leaving Certificate Students, tenable for one year (but renewable) at a Higher Grade Centre, and allotted as far as possible on the principle of one bursary to each of six districts = 37*l.*

Candidates desiring to enter on the Intermediate Course must have attained the age of 12, and must have passed the Qualifying Examination (Article 29 of Code).

Candidates desiring to enter as Junior Students, or for the Leaving Certificate Course, must have obtained the Intermediate Certificate, and Junior Student candidates must afford satisfactory evidence of their fitness to follow out their training.

II. A grant of 5*l.* under certain conditions, to the teacher of any State-aided School presenting a pupil or pupils successfully for the Committee's Bursaries for Intermediate Students.

III. Subject to Expenses of Committee, the balance, in so far as required, to go to Lerwick Anderson Educational Institute Higher Grade Public School, provided that education in secondary subjects be given free therein and that satisfactory arrangements are made for the training of Junior Students. Any balance to be applied to benefit of Committee's Bursaries.

STIRLING COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897	1,707	13	9
„ „ „ 19*th March* 1906	793	10	5

Scheme approved, 20*th December* 1906.

Allocation of grant :—

1. Payment of four-fifths of the certified deficiency, but not exceeding the following sums, to :—

	£
Stirling High School	450
Falkirk „ „	450
Grangemouth, Grange Higher Grade Public School	150

4. A bonus of 2*l.* to the head teachers of non-subsidised schools, for each pupil qualified in terms of Article 29 of the Code, who has passed into, and remained at least one session at, an approved secondary or intermediate school.

5. Bursaries awarded under previous schemes.

6. Intermediate Bursaries, in such numbers as the Committee may determine, and varying in amount according to the circumstances of each case, open preferentially to pupils who have taken the Qualifying Certificate between 12 and 13, and tenable normally until the holder has been presented for the Intermediate Certificate.

A payment of 2*l.* may be made to Parish School Boards for each pupil who has been awarded a Bursary, but is receiving secondary instruction in the primary school pending an opportunity for transferring the pupil to an approved intermediate or secondary school.

7. Secondary Bursaries in such numbers as the Committee may determine and varying in amount according to the circumstances of each case, in addition to school fees and travelling expenses (or, in some cases, boarding allowances), open to candidates nominated as Junior Students, and also to other candidates who hold the Intermediate Certificate (or equivalent qualification), and tenable for two years, but renewable for a third year in individual cases.

Bursaries to be equitably distributed, as far as possible, over the schools from which qualified applicants are drawn.

SUTHERLAND COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1907 :—			
Under the Minute of 10*th June* 1897 - - - -	427	14	5
„ „ „ „ 19*th March* 1906 - - -	119	17	1
Contributions by local authorities - - - - - -	179	17	11

Scheme approved, 12*th December* 1906.

Allocation of grant :—

A. Subsidies to Central Schools.—Payment of three-fourths of the certified deficiency, but not exceeding the following sums, to :—

	£.
Clyne Higher Grade Public School - -	70
Dornoch Burgh Higher Grade Public School -	70
Golspie Higher Grade Public School - - -	70
Kildonan, Helmsdale Higher Grade Public School - - - - - - - - -	70
Lairg Higher Grade Public School - - -	70

B. Bursaries :—

I. Thirteen Parish Bursaries (7 to Secondary Account and 6 to Technical Account) of 10*l.*, tenable for two years by pupils under 13, in certain specified parishes. Where the pupil resides at home, but over three miles from School, the bursary may be replaced by the payment of travelling expenses up to 5*l.* per annum.

II. Five County Bursaries (Technical Account) of 5*l.* tenable for one year by pupils under 16, who have completed two years at a Central School ; this amount to be increased by 7*l.* 10*s.* 0*d.* in the case of pupils from certain specified parishes who have to reside from home.

III. A sum not exceeding 80*l.* for Secondary Bursaries (Secondary Account) of the maximum of 15*l.*, and tenable for three years by Junior Students.

IV. A grant of 150*l.* to Golspie, Sutherland Technical Higher Grade School, for the board and education of five holders of Technical Bursaries.

C. Expenses of Committee = (about) 40*l.*

WIGTOWN COUNTY.

Grant for year ended 31*st March* 1907 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - - -	545	16	0
,, ,, ,, ,, 19*th March* 1906 - - - -	182	0	0
Contributions by local authorities - - - - - -	19	2	0

Scheme approved, 6*th March* 1907.

Allocation of Grant :—

1. Grants to the following, subject to the provision of twenty Free Places in the first case, and eight in the second :—

	£.
Stranraer High School - - - - - -	100
Newtown Stewart, Ewart and Douglas High Schools -	100

2. Further grants as follows :—

Stranraer High School - - - - - -	115
Newton Stewart, Ewart and Douglas High Schools -	45

3. To Wigtown Burgh and Parish Public School - - 50

4. Conditions attaching to the above grants.

5. Five Secondary Bursaries of 10*l.*, which may be augmented by an allowance for travelling or maintenance = 62*l.* 6*s.* 9*d.*

6. The above Bursaries to be open to pupils who have obtained the Intermediate Certificate or equivalent qualification, and propose to continue their education at an approved Secondary School.

7. (1) Eight Intermediate Bursaries of 5*l.* (in lieu of fees, and not entitling the holder to free education), which may be augmented as with Secondary Bursaries = 64*l.*

(2) Free places as provided for under Head 1.

8. Bursaries and Free Places are tenable for three years, or until the certificate aimed at is obtained, and no candidates must be more than 13 years of age. Preference to be given to pupils to whom an Intermediate School is not easily accessible.

9. Free Places under previous Schemes.

10. Grant received from Burgh of Newton Stewart to be paid to the Ewart and Douglas High Schools = 19*l.* 2*s.* 0*d.*

11. Expenses of Committee = (about) 25*l.*

TABLE

STATEMENT showing separately for each SECONDARY EDUCATION COMMITTEE the Year ended 15th May 1906, and the number of Schools and individual

No	Committee.	INCOME. 1. Balance in hand on 15th May 1905.	2. Grant Received for Secondary Education.	3. Sums received from Local Authorities for Technical Education.	4. Bank (and other) Interest.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Aberdeen (Burgh)	44 10 1	1,830 8 4	—	11 19 0
2	Aberdeen (County)	1,955 12 6	1,902 17 0	1,107 3 9	27 17 8
3	Argyll	706 13 10	988 10 10	—	11 6 9
4	Ayr	8,384 18 2	2,891 3 4	2,428 2 1	134 17 3
5	Banff	897 9 11	856 5 9	48 15 8	8 3 1
6	Berwick	†4 9 7	530 12 6	674 16 6	3 19 1
7	Bute	4 11 8	399 10 11	—	—
8	Caithness	1,163 5 10	559 14 11	194 10 1	18 19 9
9	Clackmannan	3 1 7	538 17 11	14 6 4	—
10	Dumbarton	1,221 7 1	1,410 3 10	—	15 4 1
11	Dumfries	249 8 1	*1,941 12 2	*1,564 19 4	16 0 5
12	Dundee (Burgh)	—	1,911 17 9	—	6 3 0
13	Edinburgh (City)	1,491 4 6	3,568 10 5	—	26 14 0
14	Edinburgh (County)	29 7 6	1,192 17 2	—	—
15	Elgin	12 13 4	672 12 10	225 15 3	3 7 10
16	Fife	1,088 1 11	2,524 7 9	—	22 7 3
17	Forfar	193 9 3½	1,505 9 4	—	8 5 10
18	Glasgow (City)	103 13 10	6,822 1 0	—	1 17 1
18A	Govan	44 14 0	2,409 16 3	400 0 0	22 8 9
19	Haddington	170 1 7	610 13 6	69 2 0	3 8 0
20	Inverness	744 11 6	1,156 14 5	325 3 5	0 11 7
21	Kincardine	446 13 8	534 19 4	272 19 6	17 5 6
22	Kinross	196 10 3	270 15 7	—	3 16 0
23	Kirkcudbright	51 18 8	619 13 3	321 2 4	2 15 5
24	Lanark	816 0 1	5,333 5 2	—	47 16 1
24A	Leith (Burgh)	274 2 4	1,022 10 3	—	7 15 5
25	Linlithgow	452 14 8	905 14 4	892 2 2	10 5 0
26	Nairn	32 19 5	292 12 7	—	—
27	Orkney	96 7 7	504 16 6	—	5 0 9
28	Peebles	18 7 8	359 13 8	—	0 5 0
29	Perth	713 16 0	1,516 19 2	—	11 14 4
30	Renfrew	1,513 3 6	3,328 19 10	—	21 11 0
31	Ross and Cromarty	1,653 0 4	1,012 0 1	399 8 1	26 6 6
32	Roxburgh	1,167 10 2	715 2 9	616 15 11	15 12 10
33	Selkirk	116 16 6	448 8 3	—	—
34	Stirling	798 11 4	1,707 13 9	—	14 7 11
35	Sutherland	1,057 3 7	427 14 5	186 9 9	7 12 10
36	Wigtown	44 9 11	545 16 0	20 4 9	8 11 0
37	Zetland	203 14 4	499 3 3	—	1 6 6
	Total	28,158 6 7½	56,270 16 1	9,761 16 11	550 12 6

* The sums entered in Columns 2 and 3 include respectively £970 16*s.* 1*d.* and £333 6*s.* 0*d.* on account of the year 1904–1905 and the relative Expenditure from these sums is included under Columns 2 and 4 of the Expenditure portion of this statement.

† This is a Debit Balance.

VII.

SUMS actually Received and actually Expended under various Heads during the Scholars participating in the Grants paid under the various Heads.

5. From other Sources.	Total Income.	EXPENDITURE. 1. Expenses of Committee.	2. Direct Subsidies to (a.) Higher Class Schools.	(b.) Higher Dpts. of State-aided Schools.	Total.	Number of Schools participating.	No.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		
—	1,886 17 5	27 4 1	1,500 0 0	300 0 0	1,800 0 0	6	1
260 10 8	5,254 1 7	386 3 1	—	300 0 0	300 0 0	3	2
—	1,706 11 5	44 4 5	—	—	—	—	3
—	13,839 0 10	531 17 4	—	—	—	—	4
—	1,810 14 5	40 8 7	—	860 0 0	860 0 0	17	5
29 9 3	1,234 7 9	21 9 10	900 0 0	100 0 0	1,000 0 0	3	6
—	404 2 7	13 9 4	—	290 0 0	290 0 0	1	7
0 2 0	1,936 12 7	52 13 4	—	470 0 0	470 0 0	6	8
—	556 5 10	15 10 0	120 0 0	415 0 0	535 0 0	4	9
—	2,646 15 0	63 17 6	—	590 0 0	590 0 0	7	10
—	3,772 0 0	136 16 2	*704 7 6	*695 12 6	*1,400 0 0	6	11
—	1,918 0 9	23 6 9	947 7 0	947 7 0	1,894 14 0	3	12
—	5,086 8 11	160 6 11	2,250 0 0	945 0 0	3,195 0 0	9	13
—	1,222 4 8	82 11 7	—	421 5 5	421 5 5	6	14
40 13 4	955 2 7	38 12 11	285 0 0	200 0 0	485 0 0	5	15
—	3,634 16 11	69 0 10	940 0 0	210 0 0	1,150 0 0	14	16
—	1,707 4 5½	28 18 6	1,000 0 0	240 0 0	1,240 0 0	6	17
—	6,927 11 11	56 6 0	3,930 0 0	2,405 0 0	6,335 0 0	13	18
—	2,876 19 0	32 1 9	620 0 0	1,759 0 0	2,379 0 0	6	18A
—	858 5 1	23 18 6	372 11 6	40 0 0	412 11 6		19
—	2,227 0 11	141 1 7	100 0 0	200 0 0	300 0 0	5	20
—	1,271 18 0	42 17 1	380 0 0	85 0 0	465 0 0	3	21
—	471 1 10	15 17 6	—	—	—	—	22
—	995 9 8	34 14 3	405 0 0	320 0 0	725 0 0	5	23
—	6,197 1 4	145 7 0	650 0 0	—	650 0 0	1	24
—	1,304 8 0	62 16 6	—	652 0 0	652 0 0	2	24A
30 2 11	2,290 19 1	418 11 11	200 0 0	200 0 0	400 0 0	3	25
—	325 12 0	10 2 6	227 5 0	—	227 5 0	1	26
—	606 4 10	44 6 11	—	—	—	—	27
—	378 6 4	6 6 0	337 12 8	—	337 12 8	1	28
—	2,242 9 6	42 11 9	570 0 0	—	570 0 0	4	29
—	4,863 14 4	102 9 3	650 0 0	1,640 0 0	2,290 0 0	10	30
—	3,090 15 0	126 11 11	115 0 0	555 0 0	670 0 0	6	31
—	2,515 1 8	42 19 0	923 10 9	109 15 7	1,033 6 4	3	32
—	565 4 9	23 10 9	338 14 0	25 0 0	363 14 0	3	33
—	2,520 13 0	68 18 10	100 0 0	50 0 0	150 0 0	3	34
—	1,679 0 7	55 3 3	—	490 0 0	490 0 0	6	35
—	619 1 8	17 3 7	360 0 0	140 0 0	500 0 0	4	36
—	704 4 1	20 14 6	—	250 0 0	250 0 0	1	37
360 18 2	95,102 10 3½	3,271 1 6	18,926 8 5	15,905 0 6	34,831 8 11	179	

* See footnote on previous page.

TABLE

STATEMENT showing separately for each SECONDARY EDUCATION COMMITTEE the Year ended

No.	Committee.	EXPENDITURE				
		3. Grants paid on the basis of a certified deficiency.	Number of Schools participating.	4. Capitation Grants on account of Attendance of Scholars in—		
				(a.) Higher Class Schools.	(b.) Higher Dpts. of State-aided Schools.	Total.
		£ s. d.		£ s. d.	£ s. d.	£ s. d.
1	Aberdeen (Burgh)	—	—	—	—	—
2	Aberdeen (County)	1,040 0 0	44	—	—	—
3	Argyll	840 0 0	12	—	—	—
4	Ayr	1,404 0 0	10	—	—	—
5	Banff	—	—	—	—	—
6	Berwick	—	—	—	—	—
7	Bute	—	—	—	—	—
8	Caithness	—	—	—	—	—
9	Clackmannan	—	—	—	—	—
10	Dumbarton	—	—	—	666 12 0	666 12 0
11	Dumfries	—	—	*364 13 10	*635 6 2	*1,000 0 0
12	Dundee (Burgh)	—	—	—	—	—
13	Edinburgh (City)	—	—	—	—	—
14	Edinburgh (County)	—	—	—	—	—
15	Elgin	—	—	—	—	—
16	Fife	—	—	400 0 0	—	400 0 0
17	Forfar	—	—	—	320 4 7	320 4 7
18	Glasgow (City)	—	—	—	—	—
18A	Govan	—	—	42 0 0	98 0 0	140 0 0
19	Haddington	—	—	—	—	—
20	Inverness	—	—	—	—	—
21	Kincardine	—	—	—	—	—
22	Kinross	—	—	—	—	—
23	Kirkcudbright	—	—	—	—	—
24	Lanark	3,528 0 0	19	—	—	—
24A	Leith (Burgh)	—	—	—	—	—
25	Linlithgow	471 13 4	3	—	—	—
26	Nairn	—	—	—	—	—
27	Orkney	—	—	—	250 0 0	250 0 0
28	Peebles	—	—	—	16 0 0	16 0 0
29	Perth	—	—	553 10 0	186 10 0	740 0 0
30	Renfrew	—	—	—	76 0 0	76 0 0
31	Ross and Cromarty	—	—	—	—	—
32	Roxburgh	—	—	—	20 0 7	20 0 7
33	Selkirk	—	—	—	—	—
34	Stirling	—	—	—	—	—
35	Sutherland	—	—	—	—	—
36	Wigtown	—	—	—	—	—
37	Zetland	—	—	—	—	—
	Total	7,283 13 4	88	1,360 3 10	2,268 13 4	3,628 17 2

No.	Committee.	Number of Schools participating.
1	Aberdeen (Burgh)	—
2	Aberdeen (County)	44
3	Argyll	12
4	Ayr	10
5	Banff	—
6	Berwick	—
7	Bute	—
8	Caithness	—
9	Clackmannan	—
10	Dumbarton	6
11	Dumfries	6
12	Dundee (Burgh)	—
13	Edinburgh (City)	—
14	Edinburgh (County)	—
15	Elgin	—
16	Fife	5
17	Forfar	2
18	Glasgow (City)	—
18A	Govan	4
19	Haddington	—
20	Inverness	—
21	Kincardine	—
22	Kinross	—
23	Kirkcudbright	—
24	Lanark	—
24A	Leith (Burgh)	—
25	Linlithgow	—
26	Nairn	—
27	Orkney	2
28	Peebles	1
29	Perth	9
30	Renfrew	1
31	Ross and Cromarty	—
32	Roxburgh	1
33	Selkirk	—
34	Stirling	—
35	Sutherland	—
36	Wigtown	—
37	Zetland	—
	Total	37

* See footnote on page 82.

VII.—*continued.*

SUMS actually Received and actually Expended under various Heads during the 15th May 1906—*continued.*

—*continued.*

5. Grants to Teachers (or Schools) in respect of Scholars transfer'd to more advd. Schs. or Depts.	6. Bursaries and Free Scholarships held at—						7. Travelling Allowances.	*Number of Scholars participating.*	No
	(*a.*) Universities.	(*b.*) Higher Class Schools.	(*c.*) Higher Depts. of State-aided Schools.	(*d.*) Technical Schools or Colleges.	Total.	*Number of Scholars participating.*			
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		£ s. d.		
—	—	—	—	—	—	—	—	—	1
—	—	321 5 0	340 15 0	—	662 0 0	*112*	—	—	2
—	—	50 0 0	105 0 0	—	155 0 0	*12*	—	—	3
—	25 0 0	1,039 5 0	463 15 0	329 15 0	1,857 15 0	*414*	584 13 3	*475*	4
—	—	—	—	—	—	—	—	—	5
—	—	—	—	—	—	—	147 18 0	*73*	6
—	—	—	81 0 0	—	81 0 0	*8*	—	—	7
16 0 0	—	—	238 15 0	—	238 15 0	*44*	15 0 0	*6*	8
—	—	—	—	—	—	—	—	—	9
51 0 0	—	—	240 0 0	—	240 0 0	*66*	4 14 9	*2*	10
—	—	495 10 0	98 0 0	5 0 0	598 10 0	*107*	—	—	11
—	—	—	—	—	—	—	—	—	12
—	—	196 5 0	—	—	196 5 0	*40*	—	—	13
—	—	270 0 0	227 10 0	—	497 10 0	*44*	56 1 2	*14*	14
—	—	140 0 0	15 0 0	20 0 0	175 0 0	*22*	33 0 7	*15*	15
—	—	100 0 0	—	—	100 0 0	*10*	—	—	16
64 0 0	—	—	—	—	—	—	—	—	17
—	—	—	—	—	—	—	—	—	18
—	—	—	—	—	—	—	—	—	18A
32 0 0	—	200 0 0	125 0 0	—	325 0 0	*65*	46 4 0	*17*	19
21 0 0	—	350 11 10	592 10 0	—	943 1 10	*102*	—	—	20
25 10 0	—	59 10 0	14 0 0	—	73 10 0	*14*	—	—	21
—	—	282 5 5	—	—	282 5 5	*34*	90 14 0	*27*	22
—	—	127 10 0	37 10 0	—	165 0 0	*17*	—	—	23
706 0 0	—	20 0 0	377 10 0	—	397 10 0	*43*	—	—	24
—	—	—	148 0 0	—	148 0 0	*33*	—	—	24A
27 0 0	—	—	—	1 9 0	1 9 0	*2*	168 19 11	*163*	25
—	16 0 0	30 0 0	—	—	46 0 0	*2*	—	—	26
—	—	—	197 8 1	—	197 8 1	*47*	—	—	27
—	—	—	—	—	—	—	—	—	28
12 0 0	—	97 10 0	7 10 0	—	105 0 0	*9*	—	—	29
—	—	94 13 0	27 10 0	—	122 3 0	*26*	166 2 5	*104*	30
13 0 0	—	100 0 0	472 10 0	—	572 10 0	*52*	—	—	31
—	—	126 0 0	—	—	126 0 0	*42*	54 4 6	*19*	32
—	—	54 0 0	6 0 0	—	60 0 0	*8*	—	—	33
218 0 0	—	190 0 0	15 0 0	—	205 0 0	*34*	58 8 2	*22*	34
—	—	10 0 0	132 10 0	5 0 0	147 10 0	*33*	—	—	35
—	—	—	—	—	—	—	—	—	36
5 0 0	—	—	206 5 9	—	206 5 0	*16*	—	—	37
1,190 10 0	41 0 0	4,354 5 3	4,168 18 1	361 4 0	8,925 7 4	*1,458*	1,426 0 9	*937*	

TABLE

STATEMENT showing separately for each SECONDARY EDUCATION COMMITTEE the Year ended

No.	Committee.	EXPENDITURE—*continued.*				
		8. Grants towards Building or Equipment of—				9. Special Payments for Technical Instruction.
		(*a.*) Higher Class Schools.	(*b.*) Higher Dpts. of State-aided Schools.	Total.	*Number of Schools participating.*	
		£ s. d.	£ s. d.	£ s. d.		£ s. d.
1	Aberdeen (Burgh)	—	—	—	—	—
2	Aberdeen (County)	—	—	—	—	868 10 2
3	Argyll	—	—	—	—	—
4	Ayr	—	—	—	—	2,248 11 8
5	Banff	—	—	—	—	54 4 11
6	Berwick	—	—	—	—	—
7	Bute	—	—	—	—	—
8	Caithness	—	3 10 0	3 10 0	*1*	49 12 9
9	Clackmannan	—	—	—	—	—
10	Dumbarton	—	—	—	—	—
11	Dumfries	—	41 8 0	41 8 0	*1*	309 6 2
12	Dundee (Burgh)	—	—	—	—	—
13	Edinburgh (City)	—	—	—	—	—
14	Edinburgh (County)	—	—	—	—	—
15	Elgin	—	—	—	—	129 0 0
16	Fife	—	—	—	—	—
17	Forfar	—	—	—	—	—
18	Glasgow (City)	—	—	—	—	—
18A	Govan	26 2 6	149 2 6	*175 5 0	*10*	—
19	Haddington	—	—	—	—	—
20	Inverness	—	—	—	—	50 0 0
21	Kincardine	—	—	—	—	100 14 1
22	Kinross	—	—	—	—	—
23	Kirkcudbright	—	—	—	—	—
24	Lanark	—	34 10 0	34 10 0	*4*	—
24A	Leith (Burgh)	—	—	—	—	100 0 0
25	Linlithgow	—	—	—	—	654 13 6
26	Nairn	—	—	—	—	—
27	Orkney	—	—	—	—	—
28	Peebles	—	—	—	—	—
29	Perth	—	—	—	—	—
30	Renfrew	—	—	—	—	—
31	Ross and Cromarty	—	40 0 0	40 0 0	*1*	18 0 1
32	Roxburgh	—	—	—	—	150 0 0
33	Selkirk	—	—	—	—	—
34	Stirling	—	—	—	—	—
35	Sutherland	—	—	—	—	—
36	Wigtown	—	—	—	—	—
37	Zetland	—	—	—	—	—
	Totals	26 2 6	268 10 6	294 13 0	*17*	4,732 13 4

* For books for use of Free Scholars.

VII.—*continued.*

SUMS actually Received and actually Expended under various Heads during the 15th May 1906—*continued.*

10. Other Payments.	11. Total Expenditure.	*Total Number of Schools participating.*	*Total Number of Scholars on account of whom payments have been made.*	12. Balance in hand on 15th May 1906.	No.
£ s. d.	£ s. d.			£ s. d.	
—	1,827 4 1	*6*	—	59 13 4	1
—	3,256 13 3	*44*	*112*	1,997 8 4	2
—	1,039 4 5	*12*	*12*	667 7 0	3
401 11 4	7,028 8 7	*10*	*889*	6,810 12 3	4
—	954 13 6	*17*	—	356 0 11	5
63 12 3	1,233 0 1	*3*	*73*	1 7 8	6
—	384 9 4	*1*	*8*	19 13 3	7
—	845 11 1	*7*	*50*	1,091 1 6	8
—	550 10 0	*4*	—	5 15 10	9
—	1,616 4 3	*7*	*66*	1,030 10 9	10
39 1 5	3,525 1 9	*6*	*107*	246 18 3	11
—	1,918 0 9	*3*	—	—	12
—	3,551 11 11	*9*	*40*	1,534 17 0	13
—	1,057 8 2	*6*	*44*	164 16 6	14
—	860 13 6	*5*	*22*	94 9 1	15
—	1,719 0 10	*14*	*10*	1,915 16 1	16
—	1,653 3 1	*6*	—	54 1 4½	17
490 0 0	6,881 6 0	*14*	—	46 5 11	18
120 0 0	2,846 6 9	*10*	—	30 12 3	18A
—	839 14 0	*3*	*82*	18 11 1	19
63 0 0	1,518 3 5	*17*	*102*	708 17 6	20
—	707 11 2	*3*	*14*	564 6 10	21
—	388 16 11	—	*34*	82 4 11	22
—	924 14 3	*5*	*17*	70 15 5	23
—	5,461 7 0	*21*	*43*	735 14 4	24
—	962 16 6	*2*	*33*	341 11 6	24A
—	2,142 7 8	*3*	*163*	148 11 5	25
—	283 7 6	*1*	*2*	42 4 6	26
—	491 15 0	*2*	*47*	114 9 10	27
—	359 18 8	*2*	—	18 7 8	28
—	1,469 11 9	*9*	*9*	772 17 9	29
—	2,756 14 8	*11*	*104*	2,106 19 8	30
50 0 0	1,490 2 0	*6*	*52*	1,600 13 0	31
—	1,426 10 5	*4*	*50*	1,088 11 3	32
—	447 4 9	*3*	*8*	118 0 0	33
—	700 7 0	*3*	*34*	1,820 6 0	34
—	692 13 3	*6*	*33*	986 7 4	35
—	517 3 7	*4*	—	101 18 1	36
—	481 19 6	*1*	*16*	222 4 7	37
1,227 5 0	66,811 10 4	*290*	*2,276*	23,290 19 11½	

Table VIII.

Summary of the foregoing Statement showing under various heads the total sums actually received and actually expended by Secondary Education Committees during the year ended 15th May 1906.

Income.

	£	s.	d.
1. *Balance in hand* on 15th May 1905	28,158	6	7½
2. *Amount received from the Scotch Education Department* under Section 2 (1) (*b*) of the Education and Local Taxation Account (Scotland) Act, 1892	56,270	16	1
3. *Contributions of local authorities* for purposes of technical education	9,761	16	11
4. *Bank* and other interest	550	12	6
5. *Other sources of income*	360	18	2
Total	£95,102	10	3½

Expenditure.

	£	s.	d.	£	s.	d.
1. *Expenses of Committees*		—		3,271	1	6
2.**Direct subsidies* to :—						
(*a.*) Higher Class Schools	18,926	8	5			
(*b.*) Higher Departments of State-aided Schools	15,905	0	6			
				34,831	8	11
3. *Grants paid on the basis of a certified deficiency*				7,283	13	4
4. *Capitation grants* on account of the attendance of scholars in :—						
(*a.*) Higher Class Schools	1,360	3	10			
(*b.*) Higher Departments of State-aided Schools	2,268	13	4			
				3,628	17	2

* The payment of these subsidies is often conditional upon the provision of certain free places.

	£ s. d.	£ s. d.
5. *Grants to Teachers (or Schools)* in respect of Scholars transferred to more Advanced Schools or Departments -	—	1,190 10 0
6. *Bursaries* and *Free Scholarships* held at :—		
(*a.*) Universities - - -	41 0 0	
(*b.*) Higher class schools - -	4,354 5 3	
(*c.*) Higher Departments of State-aided Schools - - -	4,168 18 1	
(*d*) Technical Schools or Colleges	361 4 0	
		8,925 7 4
7. *Travelling Allowances* - - - -	—	1,426 0 9
8. *Grants towards Building or Equipment* of :—		
(*a.*) Higher Class Schools - -	26 2 6	
(*b.*) Higher Departments of State-aided Schools - -	268 10 6	
		294 13 0
9. *Special payments for Technical Instruction* - - - - - - - - -	—	4,732 13 4
10. *Other payments under the Schemes*	—	1,227 5 0
Total Expenditure -		66,811 10 4
Balance in hand on 15th May 1906 - - -		28,290 19 11½
Total -		£95,102 10 3½

TABLE

STATEMENT showing separately for each SECONDARY EDUCATION COMMITTEE the Year ended 15th May 1907, and the number of Schools and individual

No.	Committee.	INCOME				
		1. Balance in hand on 15th May 1906.	2. Grants received from the Scotch Education Department. Under the Education and Local Taxation Account (Scotland) Act. 1892.	2. Grants received from the Scotch Education Department. Under the Minute of the Department dated 19th March 1906.	3. Sums received from Local Authorities for Technical Education.	4. Bank (and other) Interest.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Aberdeen (Burgh)	59 13 4	1,830 8 4	858 2 3	—	13 14 4
2	Aberdeen (County)	1,997 8 4	1,902 17 0	896 4 8	1,000 1 3	42 1 0
3	Argyll	667 7 0	988 10 10	415 0 5	—	27 9 10
4	Ayr	6,810 12 3	2,906 0 11	1,424 4 8	3,337 4 0	185 15 9
5	Banff	856 0 11	856 5 9	345 8 3	47 13 0	20 3 0
6	Berwick	1 7 8	530 12 6	174 0 3	639 3 0	6 15 4
7	Bute	19 13 3	399 10 11	105 0 6	—	—
8	Caithness	1,091 1 6	559 14 11	189 6 10	185 6 5	27 3 2
9	Clackmannan	5 15 10	538 17 11	178 7 4	13 9 9	1 17 2
10	Dumbarton	1,030 10 9	1,410 3 10	636 18 10	—	33 8 6
11	Dumfries	246 18 3	970 16 1	405 13 9	1,159 16 4	19 6 2
12	Dundee (Burgh)	—	1,911 17 9	900 19 10	—	8 6 4
13	Edinburgh (City)	1,534 17 0	3,568 10 5	1,772 18 2	—	47 12 1
14	Edinburgh County	164 16 6	1,192 17 2	522 11 1	1,341 9 5	13 0 7
15	Elgin	94 9 1	672 12 10	248 15 2	212 10 1	6 14 8
16	Fife	1,915 16 1	2,524 7 9	1,223 7 3	2,696 9 7	102 16 11
17	Forfar	54 1 4½	1,505 9 4	687 1 8	—	15 9 11
18	Glasgow (City)	46 5 11	6,822 1 0	3,485 5 10	—	—
18A	Govan	30 12 3	2,409 16 3	1,163 1 2	400 0 0	64 4 7
19	Haddington	18 11 1	610 13 6	216 2 11	64 9 11	4 0 9
20	Inverness	708 17 6	1,156 14 5	503 10 9	311 5 7	10 5 11
21	Kincardine	564 6 10	534 19 4	176 6 0	241 1 0	22 16 3
22	Kinross	82 4 11	275 10 2	39 14 10	—	2 10 3
23	Kirkcudbright	70 15 5	619 13 3	220 17 6	320 1 5	4 14 0
24	Lanark	735 14 4	5,333 5 2	2,701 14 4	—	190 0 4
24A	Leith (Burgh)	341 11 6	1,022 10 3	432 18 0	—	12 7 6
25	Linlithgow	148 11 5	905 14 4	371 8 7	857 6 4	12 13 1
26	Nairn	42 4 6	292 12 7	48 15 1	—	—
27	Orkney	114 9 10	504 16 6	160 8 8	—	5 0 3
28	Peebles	18 7 8	359 13 8	84 0 11	—	0 19 2
29	Perth	772 17 9	1,512 4 7	690 13 0	—	12 17 3
30	Renfrew	2,106 19 8	3,314 2 3	1,659 0 1	—	92 8 3
31	Ross and Cromarty	1,600 13 0	1,012 0 1	427 7 5	377 6 10	41 13 8
32	Roxburgh	1,088 11 3	715 2 9	271 2 6	579 12 1	20 3 10
33	Selkirk	118 0 0	448 8 3	130 14 11	—	7 8 8
34	Stirling	1,820 6 0	1,707 13 9	793 10 5	—	18 0 1
35	Sutherland	986 7 4	427 14 5	119 17 1	179 17 11	20 3 4
36	Wigtown	101 18 1	545 16 0	182 0 0	19 2 0	6 1 10
37	Zetland	222 4 7	499 3 3	157 9 1	—	2 18 1
	Total	28,290 19 11½	55,300 0 0	25,000 0 0	13,983 5 11	1,123 1 10

VIIA.

Sums actually Received and actually Expended under various Heads during the Scholars participating in the Grants paid under the various Heads.

		EXPENDITURE.					
5.			2. Direct Subsidies to				
From other sources.	Total Income.	1. Expenses of Committee.	(*a.*) Higher Class Schools.	(*b.*) Higher Depts. of State-aided Schools.	Total.	*Number of Schools participating.*	No.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		
—	2,761 18 3	46 4 9	1,500 0 0	300 0 0	1,800 0 0	*6*	1
—	5,838 12 3	401 17 8	—	300 0 0	300 0 0	*3*	2
—	2,098 8 1	58 5 8	—	—	—	—	3
122 11 5	14,786 9 0	597 18 5	1,380 5 0	800 0 0	2,180 5 0	*5*	4
—	2,125 10 11	63 3 0	—	792 15 8	792 15 8	*17*	5
—	1,351 18 9	24 15 0	1,000 0 0	80 0 0	1,080 0 0	*3*	6
—	524 4 8	26 9 1	—	300 0 0	300 0 0	*1*	7
—	2,052 12 10	51 3 0	—	470 0 0	470 0 0	*6*	8
—	738 8 0	26 0 10	100 0 0	420 0 0	520 0 0	*4*	9
—	3,111 1 11	68 9 6	—	1,100 0 0	1,100 0 0	*6*	10
—	2,802 10 7	143 12 3	345 16 8	329 3 4	675 0 0	*6*	11
—	2,821 3 11	34 13 11	1,050 0 0	950 0 0	2,000 0 0	*3*	12
—	6,923 17 8	159 6 1½	2,250 0 0	895 0 0	3,145 0 0	*9*	13
—	3,234 14 9	262 11 4	—	449 3 4	449 3 4	*6*	14
1 0 0	1,236 1 10	51 13 4	285 9 0	220 0 0	505 0 0	*5*	15
47 3 1	8,510 0 8	584 15 0	1,029 18 7	1,325 0 0	2,354 18 7	*14*	16
—	2,262 2 3½	54 16 9½	1,200 0 0	395 0 0	1,595 0 0	*6*	17
1 0 3	10,354 13 0	60 0 0	3,930 0 0	2,450 0 0	6,380 0 0	*14*	18
—	4,067 14 3	35 3 0	600 0 0	1,930 0 0	2,520 0 0	*7*	18A
—	913 18 2	30 18 2	200 0 0	40 0 0	240 0 0	*3*	19
—	2,690 14 2	181 11 11	100 0 0	275 0 0	375 0 0	*6*	20
—	1,539 9 5	65 0 6	420 0 0	—	420 0 0	*2*	21
4 7 6	404 7 8	15 7 3	—	—	—	—	22
—	1,236 1 7	50 1 6	470 3 10	380 0 0	850 3 10	*5*	23
	8,960 14 2	220 6 7	650 0 0	—	650 0 0	*1*	24
—	1,809 7 3	59 13 3½	—	652 0 0	652 0 0	*2*	24A
116 16 11	2,412 10 8	464 0 3	200 0 0	360 0 0	560 0 0	*3*	25
—	383 12 2	11 19 0	261 5 0	—	261 5 0	*1*	26
—	784 15 3	64 10 1	—	250 0 0	250 0 0	*2*	27
—	463 1 5	23 19 8	337 17 1	—	337 17 1	*1*	28
—	2,988 12 7	50 8 1	—	—	—	—	29
—	7,152 10 3	138 10 3	1,500 0 0	200 0 0	1,700 0 0	*3*	30
—	3,459 1 0	135 8 4	115 0 0	681 0 0	796 0 0	*7*	31
—	2,674 12 5	60 12 6	520 0 0	—	520 0 0	*1*	32
—	704 11 10	31 9 8	323 19 3	25 0 0	348 19 3	*3*	33
—	4,339 10 3	62 4 4	1,600 0 0	250 0 0	1,850 0 0	*3*	34
—	1,734 0 1	53 2 0	—	390 0 0	390 0 0	*5*	35
—	854 17 11	23 2 7	379 2 0	100 0 0	479 2 0	*6*	36
—	881 15 0	23 17 2	—	250 0 0	250 0 0	*1*	37
292 19 2	123,990 6 10½	4,517 1 9½	21,748 7 5	17,359 2 4	39,107 9 9	*176*	

TABLE

STATEMENT showing separately for each SECONDARY EDUCATION COMMITTEE the Year ended

No	Committee.	EXPENDITURE					
		3. Grants paid on the basis of a certified deficiency.	Number of Schools participating.	4. Capitation Grants on account of Attendance of Scholars in—			
				(a.) Higher Class Schools	(b.) Higher Depts. of State-aided Schools.	Total.	Number of Schools participating.
		£. s. d.		£ s. d.	£ s. d.	£ s. d.	
1	Aberdeen (Burgh)	—	—	—	—	—	—
2	Aberdeen (County)	895 0 0	23	—	—	—	—
3	Argyll	882 0 0	8	—	—	—	—
4	Ayr	1,636 0 0	10	—	—	—	—
5	Banff	—	—	—	—	—	—
6	Berwick	—	—	—	—	—	—
7	Bute	—	—	—	—	—	—
8	Caithness	—	—	—	—	—	—
9	Clackmannan	—	—	—	—	—	—
10	Dumbarton	—	—	—	766 18 0	766 18 0	6
11	Dumfries	—	—	165 8 1	309 11 11	475 0 0	6
12	Dundee (Burgh)	—	—	—	—	—	—
13	Edinburgh (City)	—	—	—	—	—	—
14	Edinburgh (County)	—	—	—	—	—	—
15	Elgin	—	—	—	—	—	—
16	Fife	—	—	—	—	—	—
17	Forfar	—	—	—	—	—	—
18	Glasgow (City)	—	—	—	—	—	—
18A	Govan	—	—	51 0 0	99 0 0	150 0 0	3
19	Haddington	—	—	—	—	—	—
20	Inverness	—	—	—	—	—	—
21	Kincardine	—	—	—	—	—	—
22	Kinross	—	—	—	—	—	—
23	Kirkcudbright	—	—	—	—	—	—
24	Lanark	3,307 10 0	20	—	—	—	—
24A	Leith (Burgh)	—	—	—	—	—	—
25	Linlithgow	—	—	—	—	—	—
26	Nairn	—	—	—	—	—	—
27	Orkney	—	—	—	—	—	—
28	Peebles	—	—	—	16 0 0	16 0 0	1
29	Perth	—	—	582 0 0	87 0 0	669 0 0	7
30	Renfrew	1,355 0 0	7	—	68 0 0	68 0 0	1
31	Ross and Cromarty	—	—	—	—	—	—
32	Roxburgh	—	—	—	—	—	—
33	Selkirk	—	—	—	—	—	—
34	Stirling	—	—	—	—	—	—
35	Sutherland	—	—	—	—	—	—
36	Wigtown	—	—	—	—	—	—
37	Zetland	—	—	—	—	—	—
	Total	8,075 10 0	68	798 8 1	1,346 9 11	2,144 18 0	24

VIIA.—*continued.*

SUMS actually Received and actually Expended under various Heads during the 15th May 1907, &c.—*continued.*

—*continued.*

5. Grants to Teachers (or Schools) in respect of Scholars transferred to more advanced Schools or Departments.	6. Bursaries and Maintenance or other Allowances† :—										No.
	(a) Intermediate Bursaries and Maintenance Allowances.	(b.) Secondary Bursaries and Maintenance Allowances.		(c) Other Bursaries (at Universities, Technical Schools or Colleges, &c.)		Number of Scholars participating.	Total.	Sum placed at the disposal of the School Board in terms of the Regulations for the Preliminary Education, &c., of Teachers.†	
		(i) To Junior Students.	(ii) To pupils other than Junior Students.						
£ s. d.	No.	£ s. d.	No.	£ s. d.	No.	£ s. d.	No.	£ s. d.	£ s. d.	£ s. d.	
—	—	—	—	—	—	—	—	—	—	—	1
44 0 0	34	266 0 0	—	—	28	347 10 0	—	—	112	613 10 0	—	2
—	23	220 0 0	4	10 0 0	1	2 10 0	—	—	28	232 10 0	—	3
—	130	418 1 0	—	—	—	—	604	680 2 1	734	1,098 3 1	—	4
—	—	—	—	—	—	—	—	—	—	—	—	5
—	—	—	—	—	—	—	—	—	—	—	—	6
—	27	184 0 0	1	15 0 0	—	—	—	—	28	199 0 0	—	7
12 0 0	34	180 0 0	9	45 0 0	—	—	1	30 0 0	44	255 0 0	—	8
—	4	13 8 0	6	69 6 0	—	—	—	—	10	82 14 0	—	9
32 0 0	72	255 0 0	22	169 10 0	2	15 0 0	—	—	96	439 10 0	—	10
—	115	467 15 0	7	20 16 8	19	127 10 0	28	85 8 0	169	701 9 8	—	11
—	—	—	—	—	—	—	—	—	—	—	80 0 0	12
—	148	735 0 0	1	12 10 0	2	25 0 0	—	—	151	772 10 0	1,100 0 0	13
4 10 0	38	142 12 3	9	45 0 0	11	276 11 0	118	244 1 5	176	708 4 8	—	14
—	20	57 0 0	10	73 0 0	35	250 17 6	1	20 0 0	66	400 17 6	—	15
—	86	297 13 10	25	116 0 0	10	50 0 0	32	77 14 0	153	541 7 10	—	16
51 0 0	—	—	19	111 10 0	—	—	—	—	19	111 10 0	—	17
—	62	633 10 0	6	105 0 0	—	—	—	—	68	738 10 0	1,250 0 0	18
—	—	—	—	—	—	—	—	—	—	—	—	18A
—	27	70 9 5	—	—	—	—	—	—	27	70 9 5	—	19
28 0 0	73	643 15 0	—	—	18	205 0 0	—	—	91	848 15 0	—	20
40 10 0	28	124 0 0	—	—	—	—	—	—	28	124 0 0	—	21
—	29	240 17 0	—	—	—	—	—	—	29	240 17 0	—	22
—	16	202 10 0	5	13 12 4	—	—	—	—	21	216 2 4	—	23
693 0 0	48	*465 0 0	—	—	—	—	—	—	43	465 0 0	—	24
—	34	90 3 0	—	—	3	18 0 0	—	—	37	108 3 0	—	24A
25 0 0	54	100 15 9	8	48 0 0	—	—	—	—	62	148 15 9	—	25
—	7	32 0 0	3	23 1 11	1	30 0 0	1	16 0 0	12	101 1 11	—	26
—	57	107 2 0	8	18 10 0	24	156 0 0	—	—	89	281 12 0	—	27
—	5	23 10 0	3	22 10 0	—	—	—	—	8	46 0 0	—	28
15 0 0	39	195 10 0	17	208 0 0	9	127 0 0	—	—	65	530 10 0	—	29
—	110	391 14 5	—	—	6	17 15 0	—	—	116	409 9 5	—	30
13 0 0	32	336 0 0	—	—	23	151 0 0	—	—	55	487 0 0	—	31
—	31	107 9 2	5	38 7 0	—	—	—	—	36	145 16 2	—	32
—	6	54 0 0	3	24 0 0	2	7 10 0	-	—	10	85 10 0	—	33
238 0 0	67	824 6 2	21	333 0 0	—	—	—	—	88	1,157 6 2	—	34
—	23	105 0 0	1	7 10 0	—	—	10	225 0 0	34	337 10 0	—	35
—	—	—	—	—	—	—	—	—	—	—	—	36
20 0 0	19	206 5 0	—	—	—	—	—	—	19	206 5 0	—	37
1,216 0 0	1548	8,190 7 0	193	1,529 3 11	194	1,807 3 6	795	1,378 5 6	2,729	12,904 19 11	†2,430 0 0	

* Expenditure in respect of Secondary Bursaries is included in this sum.
† See Table IX.

TABLE

STATEMENT showing separately for each SECONDARY EDUCATION COMMITTEE the Year ended

No.	Committee.	EXPENDITURE—*continued.*				
		7. Grants towards Building or Equipment of—				8. Special Payments for Technical Instruction.
		(*a*) Higher Class Schools.	(*b*) Higher Depts. of State-aided Schools.	Total.	*Number of Schools Participating.*	
		£ *s. d.*	£ *s. d.*	£ *s. d.*		£ *s. d.*
1	Aberdeen (Burgh)	—	—	—	—	—
2	Aberdeen (County)	—	—	—	—	386 18 8
3	Argyll	—	—	—	—	—
4	Ayr	—	—	—	—	2,410 14 7
5	Banff	—	—	—	—	48 15 8
6	Berwick	—	—	—	—	—
7	Bute	—	—	—	—	—
8	Caithness	—	30 0 0	30 0 0	3	—
9	Clackmannan	—	—	—	—	—
10	Dumbarton	—	—	—	—	—
11	Dumfries	—	5 8 10	5 8 10	2	199 9 1
12	Dundee (Burgh)	—	—	—	—	—
13	Edinburgh (City)	—	—	—	—	—
14	Edinburgh (County)	—	—	—	—	1,371 8 11
15	Elgin	—	—	—	—	94 10 5
16	Fife	—	—	—	—	1,505 0 11
17	Forfar	—	—	—	—	—
18	Glasgow (City)	—	—	—	—	—
18A	Govan	—	—	—	—	—
19	Haddington	—	—	—	—	—
20	Inverness	—	—	—	—	121 11 4
21	Kincardine	—	—	—	—	35 4 8
22	Kinross	—	—	—	—	—
23	Kirkcudbright	—	—	—	—	—
24	Lanark	—	66 0 0	66 0 0	2	—
24A	Leith (Burgh)	—	—	—	—	100 0 0
25	Linlithgow	—	—	—	—	561 9 10
26	Nairn	—	—	—	—	—
27	Orkney	—	—	—	—	—
28	Peebles	—	—	—	—	—
29	Perth	—	—	—	—	—
30	Renfrew	—	—	—	—	—
31	Ross and Cromarty	—	—	—	—	81 12 5
32	Roxburgh	—	—	—	—	150 0 0
33	Selkirk	—	—	—	—	—
34	Stirling	—	—	—	—	—
35	Sutherland	—	—	—	—	—
36	Wigtown	—	—	—	—	—
37	Zetland	—	—	—	—	—
	Totals	—	101 8 10	101 8 10	7	7,066 17 6

VIIA.—*continued.*

SUMS actually Received and actually Expended under various Heads during the 15th May 1907, &c.—*continued.*

9. Other Payments.	10. Total Expenditure.	*Total Number of Schools participating.*	*Total Number of Scholars on account of whom payments have been made.*	11. Balance in hand on 15th May 1907.	No.
£ s. d.	£ s. d.			£ s. d.	
—	1,846 4 9	*6*	—	915 13 6	1
—	2,641 6 4	*23*	*112*	3,197 5 11	2
—	1,172 15 8	*8*	*28*	925 12 5	3
60 0 0	7,983 1 1	*11*	*734*	6,803 7 11	4
—	904 14 4	*17*	—	1,220 16 7	5
52 0 0	1,156 15 0	*3*	—	195 3 9	6
—	525 9 1	*1*	*28*	*1 4 5	7
—	818 3 0	*6*	*44*	1,234 9 10	8
—	628 14 10	*4*	*10*	109 13 2	9
—	2,406 17 6	*6*	*96*	704 4 5	10
—	2,199 19 10	*6*	*169*	602 10 9	11
—	2,114 13 11	*3*	—	706 10 0	12
—	5,176 16 1½	*9*	*151*	1,747 1 6½	13
—	2,795 18 3	*6*	*176*	438 16 6	14
—	1,052 1 3	*5*	*66*	184 0 7	15
—	4,986 2 4	*14*	*153*	3,523 18 4	16
—	1,812 6 9½	*6*	*19*	449 15 6	17
490 0 0	8,918 10 0	*14*	*68*	1,436 3 0	18
120 0 0	2,835 3 0	*10*	—	1,232 11 3	18A
—	341 7 7	*3*	*27*	572 10 7	19
23 0 0	1,577 18 3	*6*	*91*	1,112 15 11	20
—	684 15 2	*2*	*28*	854 14 3	21
—	256 4 3	—	*29*	148 3 5	22
—	1,116 7 8	*5*	*21*	119 13 11	23
—	5,401 16 7	*21*	*48*	3,558 17 7	24
—	919 16 3½	*2*	*37*	889 10 11½	24A
—	1,759 5 10	*3*	*62*	653 4 10	25
—	374 5 11	*1*	*12*	9 6 3	26
—	596 2 1	*2*	*89*	188 13 2	27
—	423 16 9	*2*	*8*	39 4 8	28
—	1,264 18 1	*7*	*65*	1,723 14 6	29
—	3,670 19 8	*10*	*116*	3,481 10 7	30
50 0 0	1,563 1 9	*7*	*55*	1,895 19 3	31
—	876 8 8	*1*	*56*	1,798 3 9	32
—	465 18 11	*3*	*10*	238 12 11	33
—	3,307 10 6	*3*	*88*	1,031 19 9	34
—	780 12 0	*5*	*34*	953 3 1	35
—	502 4 7	*6*	—	352 13 4	36
—	500 2 2	*1*	*19*	381 12 10	37
795 0 0	78,359 5 9½	*213*	*2,729*	45,631 1 1	

* This is a Debit Balance.

TABLE VIIIA.

SUMMARY of the foregoing STATEMENT, showing under various heads the total sums actually received and actually expended by Secondary Education Committees during the year ended 15th May 1907.

INCOME.

	£ s. d.	£ s. d.
1. *Balance in hand* on 15th May 1906 -	—	28,290 19 11½
2. *Amount received from the Scotch Education Department* under Section 2 (1) (*b*) of the Education and Local Taxation Account (Scotland) Act, 1892 - -	55,300 0 0	
Under the Minute of 19th March 1906 -	25,000 0 0	
		80,300 0 0
3. *Contributions of local authorities* for purposes of technical education - -		13,983 5 11
4. *Bank* and other interest - - - -		1,123 1 10
5. *Other sources of income* - - - -		292 19 2
Total -		£123,990 6 10½

EXPENDITURE.

	£ s. d.	£ s. d.
1. *Expenses of Committees* - - -	—	4,517 1 9½
2.**Direct subsidies* to—		
(*a.*) Higher Class Schools - -	21,748 7 5	
(*b.*) Higher Departments of State-aided Schools - - -	17,359 2 4	
		39,107 9 9
3. *Grants paid on the basis of a certified deficiency* - - - - - - -		8,075 10 0
4. *Capitation grants* on account of the attendance of scholars in :—		
(*a.*) Higher Class Schools - -	798 8 1	
(*b.*) Higher Departments of State-aided Schools - - - -	1,346 9 11	
		2,144 18 0
5. *Grants to Teachers* (*or Schools*) in respect of Scholars transferred to more Advanced Schools or Departments -	—	1,216 0 0

* The payment of these subsidies is often conditional upon the provision of certain free places.

	£ s. d.	£ s. d.
6. *Bursaries* and *Maintenance or other Allowances* :—		
(*a.*) Intermediate Bursaries and Maintenance Allowances -	8,190 7 0	
(*b.*) Secondary Bursaries and Maintenance Allowances - - -		
(*i*) To Junior Students -	1,529 3 11	
(*ii*) To pupils other than Junior Students -	1,807 3 6	
(*c.*) Other Bursaries (at Universities, Technical Schools, or Colleges, etc.) - - - - - -	1,378 5 6	
		*12,904 19 11
Sums placed at the disposal of the School Board in terms of Article 57 of the Regulations for the Preliminary Education, &c., of Teachers - -	—	*2,430 0 0
7. *Grants towards Building or Equipment* of :—		
(*a.*) Higher Class Schools - - -	—	
(*b.*) Higher Departments of State-aided Schools - - - -	101 8 10	
		101 8 10
8. *Special payments for Technical Instruction* - - - - - - - -	—	7,066 17 6
9. *Other payments under the Schemes* - -	—	795 0 0
Total Expenditure -		78,359 5 9½
Balance in hand on 15th May 1907 -		45,631 1 1
Total -		£123,990 6 10½

Table IX.

Details of expenditure by certain School Boards out of sums placed at their disposal by Secondary Education Committees, in terms of the Regulations for the Preliminary Education, &c., of Teachers, during the year ended 15th May, 1907.

(*See column 6 on page 93 and Head 6 above.*)

School Boards.	Sums placed at disposal of School Board by Secondary Education Committees.	Particulars of expenditure by School Boards, out of sums placed at their disposal.						Balance in hand on 15th May 1907.
		Intermediate Bursaries and Maintenance Allowances.		Secondary Bursaries and Maintenance Allowances.		Total.		
	£ s. d.	*No.*	£ s. d.	*No.*	£ s. d.	*No.*	£ s. d.	£ s. d.
Dundee Burgh School Board -	80 0 0	—	– – –	*3*	30 0 0	*3*	30 0 0	50 0 0
Edinburgh „ „ „ -	1,100 0 0	*41*	537 0 0	*37*	543 10 0	*78*	1,080 10 0	19 10 0
Glasgow „ „ „ -	1,250 0 0	*68*	718 0 0	*35*	537 10 0	*103*	1,255 10 0	†*5 10 0*
Totals - - -	2,430 0 0	*109*	1,255 0 0	*75*	1,111 0 0	*184*	2,366 0 0	64 0 0

* See Table IX. † Debit Balance.

SECONDARY EDUCATION (SCOTLAND).

REPORT FOR THE YEAR 1908

BY

J. STRUTHERS, Esq., C.B., LL.D.

Presented to both Houses of Parliament by Command of His Majesty.

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1908.

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REPORT for the year 1908, by J. STRUTHERS, Esq., C.B., LL.D., on SECONDARY EDUCATION in SCOTLAND.

9th September, 1908.

MY LORDS,

I HAVE the honour to present to Your Lordships my fourth Annual Report on Secondary Education in Scotland. As your Lordships are aware, there is a possibility that in the near future the whole framework of our educational system may be materially modified and strengthened through legislative enactment. The time is, therefore, scarcely opportune for dwelling at much length on the wider problems of organisation. One or two matters are, indeed, of such conspicuous moment as to call imperatively for notice. But, after these have been dealt with briefly, I propose to proceed at once to the customary survey of the work actually accomplished in the schools during the past session.

In my Report for 1907 it was remarked that the most important administrative event of the year had undoubtedly been the issue of the new Regulations as to Grants to Secondary Schools. It may be convenient to repeat now the general explanation there supplied as to the principles governing the distribution of the money—money given, be it remembered, in lieu of the old Science and Art Grant. Nothing is payable in respect of any pupil who is under 12 years of age, or who has not satisfactorily completed what may be described as the elementary stage of his education. Once those requirements are met, every pupil becomes eligible for grant, provided that he is pursuing an Intermediate curriculum in which all the main branches of a liberal education are fairly represented, and which has a normal duration of three years, with the Intermediate Certificate as its natural goal. By the time that Certificate has been gained, say at 15 or 16 years of age, the mind ought to be so far formed that pupil and teacher are in a position to judge of the particular direction in which further study can be most profitably pursued. During the remaining period of school life, therefore—that is, while the Leaving Certificate is being prepared for—some degree of specialisation may be not merely permitted, but encouraged. There is no reason why a boy or girl who has developed a taste for literature and history, or for languages, or for mathematics and science, should not have a certain degree of freedom to cultivate his or her particular talent, treating the other school subjects as more or less subsidiary.

Intermediate and post-Intermediate curricula alike have to be approved by the Department, and the delicate duty thus

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imposed upon us has rendered our administrative task peculiarly responsible during the session that has just come to a close. It is mainly in regard to the Intermediate curriculum that the detailed discussion of difficulties has been necessary. Our aim here has been to secure, first and foremost, a reasonable amount of attention to the mother-tongue, and thereafter to make sure that a proper balance was being observed between the linguistic and the realistic sides of intellectual discipline. We have carefully refrained from dogmatising on the points at issue, and have endeavoured to consider every proposal strictly on its merits. In regard to the treatment of the majority of the subjects, it has generally proved that there was little or nothing to suggest by way of amendment. Not seldom, however, we have had to urge a greater measure of generosity towards English. And we have occasionally found Managers so little alive to the necessity of giving any place at all to the very subjects in respect of which the grant was originally made, that we have been reluctantly compelled to take the extreme course of fixing a *minimum* amount of instruction in Science and Drawing, and of intimating that we could not approve of any Intermediate curriculum where the time allowed for these two combined fell below an average of one hour a day during each of the three years. If it is borne in mind that in both subjects the method of instruction is entirely practical and consequently entails no home study, it will hardly be contended that this minimum demand is in any way excessive. As a matter of fact, it represents considerably less time than was offered in the original proposals of a good many school authorities.

It is pleasing to be able to record that not a few who had serious misgivings as to the wisdom of introducing Science and Drawing into the normal curriculum have been convinced by experience of the value of such teaching, and have frankly borne testimony to the beneficial effect which it is calculated to have on the mental development of the ordinary pupil. On the other hand, it would be idle to deny that there have been those whom the new requirement, modest though it be, has moved to something approaching genuine alarm. Perhaps such alarm is not altogether groundless, although it is certainly a mistake to lay the responsibility on Science or on Drawing. The real truth is that the policy forced upon us by circumstances has incidentally had the effect of bringing to the surface a group of difficulties which would inevitably have emerged sooner or later without any direct action upon our part. It has revealed with striking clearness a fact which watchful observers had long ago detected. The arrangements governing language-study in Scottish schools rest upon a basis that is not sufficiently well-considered to be absolutely secure. They are largely the result of accident. Looking back thirty years or so, we find Latin and Greek holding undisputed sway almost everywhere; if French and German were not entirely

elbowed out, they existed merely upon sufferance. Gradually all this has changed. The public has become more and more keenly alive to the importance of the modern tongues. The turning-point was reached when they were definitely welcomed within the walls of the Universities. The consequences of that victory have been very far-reaching. Whereas a generation ago the best Secondary Schools were content to bring pupils to the gates of the University equipped for further study in two languages other than English, the humblest of them nowadays (owing to regulations which do not necessarily embody present-day University opinion) are driven to aim at what is a much higher level of attainment in three. Language has been added to language without adequate reflection on what was involved, and without regard to the corresponding rise in the standard of mathematical teaching. Even before the advent of the Regulations as to Grants to Secondary Schools, with their plea for a single hour a day for Science and Drawing, the struggle had grown too severe. Those who are ground between the upper and the nether millstones were already crying out. To-day the position is such that it behoves all who have the interests of language-study at heart to examine the whole situation carefully, with a view to discovering where the most satisfactory remedy lies.

In the first place, the teachers concerned should scrutinise their own methods of instruction with unsparing vigilance to see that there is no waste of energy, no time misspent in acquiring useless knowledge. In the second place—and it is perhaps here that the need for consideration is most pressing—those who are responsible for the framing of curricula should strive to attain to a clear understanding as to what the ends of language study are, and as to how these ends can be most surely and economically attained. Too many are still under the obsession that a smattering of two or three languages has more educational value than a sound knowledge of one. They do not realise that by limitation and concentration at the outset they may hope to render the single language chosen something like a real possession to the ordinary boy or girl, and may at the same time make certain, in the case of the brighter pupils, of laying a deep and sure foundation on which a knowledge of other tongues can be much more rapidly built up. Lastly, the claims of the various languages upon the attention of different groups of pupils—Latin and Greek, Latin and French, French and German, Latin and German, are all natural combinations—require to be weighed with full deliberation, and measures taken accordingly. There is a danger that, if matters are allowed to drift, the field of selection may ere long be unduly restricted. Our Inspectors report a marked decline in the number of pupils beginning German and Greek. In so far as this decline indicates that the less gifted are no longer being encouraged to attempt more than they can overtake, it

must be counted as a gain. It threatens grave loss to the intellectual life of the nation, if it implies that the study of the languages concerned is being hampered by artificial restrictions.

Our officers will always be glad to give any assistance they can, whether by conference or otherwise, towards the solution of the difficulties involved. In the meantime it may be helpful to mention some of the more important points that school authorities would do well to keep before them in approaching the question. To begin with, there should be time within the limits of the Intermediate curriculum, as we conceive it, to acquire a really good elementary knowledge of one language and also, under ordinary circumstances, to break ground in a second. Again, so far as any regulations of ours go, there is absolute freedom of choice as to what language or languages are to be taken up at this stage. If French or Latin is to be studied at all, there are strong educational arguments in favour of its being commenced early. But exactly the same might be said of German, and there is no reason, except the limitation of staff, why the pupil who restricts himself to one language should not have an option offered him. It follows that, in the larger schools at all events, he ought to be free to select which he pleases, while a similar liberty of selection ought of course to extend to other languages as they may be taken up. It is, however, to the post-Intermediate curriculum that we must mainly look for the special development of the linguistic or any other side of school study. That is the soil in which Greek at least will most naturally flourish, while the powerful influence of tradition is always likely to be operative in the direction of making German the second foreign language rather than the first. Nor must the Universities be forgotten. It is well known that they are on the eve of introducing momentous changes into their Arts curricula. It is not too much to say that upon the nature of these changes will in very large measure depend the future of language-study in Scotland.

Since the date of my last Report the series of Memoranda, to which I there made reference, has received two additions, treating respectively of History and of Nature Study and Science. Like their predecessors, the newcomers have received a friendly welcome. It has been recognised that these Memoranda are not put forward as final or authoritative documents, but that, as the preface says, they are meant to be suggestive only. Their issue was undertaken in direct response to various appeals for guidance as to the best methods of handling the different school subjects. At the same time the views expressed embody, it is believed, the ideals and aspirations that animate the best schools, and few, if any, specific recommendations are made which are not supported by the actual experience of teachers of repute. There is every reason to think that the series is fulfilling the purpose for which it was intended. Each

successive number as it appeared has stimulated interesting discussion and criticism among those who are more immediately addressed. Such evidence of vitality is welcome for the present and full of promise for the future. It may not be irrelevant to add that the attention the Memoranda have aroused has been by no means confined to Scotland. We hope shortly to publish similar documents dealing with the teaching of Geography and of Music.

In speaking of the new Regulations as to Grants to Secondary Schools some mention was made of the possibilities of the post-Intermediate curriculum as a field of special study. It is axiomatic that, if these possibilities are to be realised, the curriculum must be spread over a sufficiently long period of time. Up till now the great majority of post-Intermediate curricula submitted for approval extend over only two years. This is perhaps inevitable at the inception of a new movement. But it is earnestly to be hoped that ere long three may become the rule. Such a consummation would bring Scotland into line with the majority of other civilised countries so far as regards the normal leaving age of secondary pupils, and would also secure to the best teachers a reasonable opportunity of making the most of the material that comes to their hands. In fixing the duration of the normal Junior Student course at three years Your Lordships have given a very clear lead, the full significance of which will probably be better appreciated if it is borne in mind that last autumn we accepted the nomination of no fewer than 1,457 first-year Junior Students.

This formidable contingent of secondary pupils, for it is primarily in that light that they ought to be regarded, are receiving their instruction at 110 recognised Junior Student Centres, 89 of which are under the direct management of School Boards. So far as the present needs of the country are concerned, the supply of these Centres would appear to be ample. I am glad to say that, although some of those which have provisionally secured a place upon the list have still to vindicate their claim to permanent recognition, the majority are doing admirable work. One result of the issue of the Regulations as to the Preliminary Education, &c., of Teachers has thus been to give a fresh impetus to the development of Secondary Education in quarters where, without this encouragement, it might have been apt to languish. The cordiality with which Managers have taken up the matter, and the efforts they have made to provide the necessary staff and equipment, are all the more commendable in view of the fact that, contrary to the impression that sometimes prevails, the maintenance of an efficient Junior Student Centre is not calculated to be a "paying" venture. The extra grant earned is at the best no more than adequate to meet the extra outlay, for the status of a Junior Student Centre is accorded only to schools which are so staffed and equipped as to offer a full course of Secondary

Education. A considerable proportion of the Centres are technically "Higher Class" schools. The remainder are Higher Grade Schools conducted under Chapter IX. of the Code.

The total number of Higher Class Secondary (and Preparatory) Schools inspected during the past year has been 108, while the total number of Higher Grade Schools has risen from 155 to 171. A careful study of the way in which these are distributed goes to show that, numerically at least, the supply must be almost complete. Here too, however, there are individual institutions that have still to make good their claim to the rank to which they aspire. We continue to keep a careful watch upon the performance of those whose position is at all doubtful. Should they fail to develop in proportion to their opportunities, the recognition they now enjoy will have to be withdrawn. In this connection we regard as the most reliable test of efficiency the extent to which pupils are successfully presented for Group Certificates (Intermediate and Leaving).

On previous occasions I have drawn Your Lordships' attention to the growing importance of the part which these Group Certificates play in the machinery of our educational organisation, and have described the recent modifications in the system under which Intermediate Certificates are awarded. So far as the wishes of the Department go, there is every desire to attach increasing value to the opinion of the teachers on the attainments of their pupils. As was explained in my last Report, no candidate for the Intermediate Certificate is now allowed to pass, or to be set aside, without a careful weighing of the facts of his school history,—the reasoned opinion of the Headmaster as to his general attainments, the marks assigned him by the teachers of particular subjects, the relative position he occupies among his class-fellows, and the like. So conspicuous has been the success of this experiment that it seems justifiable to propose a further advance. Accordingly, we hope shortly to lay before Managers the outline of a scheme for extending the operation of the new system so as to include the award of Leaving Certificates also. Naturally the details will require careful consideration, but there seems to be no reason why we should not look forward to making the change in 1910. In the meantime, both the teachers and the Department will be able to profit by another year's experience with the Intermediate Certificate alone. The prospect of the alteration I have foreshadowed renders it desirable to emphasise once again the leading principles upon which our procedure there is based.

Intermediate Certificates are granted only to pupils who satisfactorily complete an approved curriculum extending over three years The teacher of each subject has to supply us with an estimate of the work done in his particular branch by all of

the candidates put forward, and the Headmaster has, at the same time, to express an opinion on their attainments as a whole. This information is put into the hands of our Inspectors whose duty it is, through oral examination of the pupils or otherwise, to try to bring about a reasonable measure of agreement as to the standards that the responsible teachers should employ. In the meantime the candidates must submit themselves to the tests (written or practical) set at the Leaving Certificate Examination of the current year. We only ask that they shall be presented in English, at least one language other than English, Mathematics, Science, and Drawing; but, if their attainments are such as to justify their presentation in other subjects, they may be presented accordingly, when they will receive full credit for any good work done. In all cases presentation is on the Lower Grade. When the results of the tests have been received, they are collated with the other material at our disposal, including the reports of our Inspectors, and judgment given accordingly.

This year the written papers were for the first time set in April. So far as can be judged, the change of date, which carries with it obvious advantages, has not been attended with any of the drawbacks that some of those most deeply interested had anticipated. The Department made full allowance for the innovation when the papers were being set, and they were prepared to make full allowance for it also in the marking. As a matter of fact, it was surprising to find how slight a readjustment of the standard was required to adapt it to the new conditions. Whether the Group Certificate or the single subjects be taken as a test, there is not a single case in which the percentage of passes is not at least equal to the average of the last few years. In the great majority of instances there is actually a more or less considerable advance upon the session immediately preceding. This result speaks well for the schools. It also indicates, I think, that our examiners have been able to devise papers which do not lend themselves to "cram" and in which sound work throughout the course enjoys the preponderating weight that it deserves. Nor would it be fair to let this opportunity pass without a warm acknowledgment of the debt we owe to the teachers for the care which so many of them have obviously devoted to the assessing of the marks of their pupils. There were still, it is true, a considerable number of lists where the estimates given were much too generous, and there were others which were erratic or which betrayed an evident reluctance to discriminate. But, on the whole, there was clear proof that the sense of responsibility in this important matter is steadily growing. In particular, the general opinion given by the Headmasters was often exceedingly helpful; there were not a few schedules where we should have been justified in accepting it *simpliciter*, and where our task was merely one of verification.

In the end we were able to award Intermediate Certificates to 3,727 candidates as against 3,785* awarded in 1907. This represents a slight decrease. On the other hand, it must be remembered that, owing to special circumstances, last year's presentation was abnormally large, 221 more applicants having come forward then than on the present occasion. So far as we could judge from the evidence before us, it was beyond doubt that the proportion of really good work was markedly higher this year. The impression of relative excellence was indeed so strong that we confidently expected that the rise in the percentage of successes would be even more striking than has actually proved to be the case. The disappointment of our expectation suggested a scrutiny of the circumstances under which candidates had failed to qualify for Certificates. It may be useful to mention by way of warning that quite a large number of those who were rejected turned out to be only a month or two over the minimum age. Plainly there has been a tendency to premature presentation. Again, it was found that among those who broke down were many Pupil Teachers, and that, too, although every such case had been weighed sympathetically and with the fullest desire to be considerate to those who are working under great difficulties and often in isolated schools. The total number of Leaving Certificates granted shows a most gratifying advance, being 901 as against 733 in 1907.* The percentage of successes remains about the same, the increase being wholly due to the steadily growing tendency on the part of pupils to complete the normal Secondary course. Out of ten candidates put forward for Commercial Certificates, six reached the necessary standard. For the Technical Certificate five were presented and five passed, while the seven candidates for Army Certificates gave an equally creditable account of themselves. A Special Group Certificate was awarded to one candidate out of three.

As Your Lordships will recollect, the written papers of this year presented some features of novelty. Taken all over, the changes promise to be highly beneficial. Their more direct effects can most appropriately be discussed under the heads of the individual subjects, to a review of which I now propose to proceed. It should be explained that in the remarks which follow I shall keep before me not only the reports of the revisers who have assisted in the arduous work of marking the written papers, but also the mass of useful material that has been placed at my disposal by the Inspectors who have personally visited the various schools.

* The difference between this figure and that given in last year's Report on Secondary Education is due to the fact that, at the date of the issue of the Report, a certain number of cases were still undecided, pending the receipt of supplementary information from the School authorities.

ENGLISH.

A careful perusal of the general remarks made by our Inspectors, as well as of their criticisms on the work of particular schools, is calculated, I am glad to say, to afford convincing proof of a steady advance in this all-important subject. Within the past year there has been real progress in the direction of laying down definite schemes of work, so arranged as to secure that pupils who pass through the complete course shall receive some insight into the possibilities of enjoyment that an acquaintance with literature opens up for them, and at the same time some systematic discipline in the use of the mother-tongue as an instrument of cultivated expression. It goes almost without saying that not a few of these schemes are as yet tentative and inchoate in character and form. Frequently, for instance, there is a lack of variety. Shakespeare, giant though he be, ought never to be permitted to occupy the whole field. A disposition to shirk the study of prose is occasionally excused on the ground that it is too difficult or too uninteresting. But, as one of our Inspectors remarks, prose which is worthy of close and minute study is in fact difficult, although it need not be uninteresting; the best teachers succeed in making the difficulty itself a source of interest. This suggests another point calling for remark. It is scarcely a matter for surprise that many have not yet succeeded in striking a proper balance between the two different types of reading, the cursory and the intensive. On the one hand, in the effort to widen the pupil's knowledge of literature, there is a risk that he may be allowed to neglect those hard, intellectual elements of training which are essential to the acquisition of a tolerable mastery of the language—accurate interpretation, a careful study of diction, and some acquaintance with historical grammar; if the study of English is to be utilised to impart the maximum amount of educational benefit, there must certainly be some part of the work in which every difficulty is resolutely faced, and any sign of slovenliness and inexactitude sternly repressed. Elsewhere, on the other hand, there is still the tendency—so apt to be fostered by over-examination—which condemns the young mind to wander in a thirsty wilderness of minutiæ where even the most distant glimpse of the promised land is for ever denied it. A judiciously mapped-out plan of home reading can be of the greatest assistance here, and it is satisfactory to find that such a plan is becoming more and more a recognised element in every curriculum. As a rule, however, these plans are hardly as yet designed with the forethought that is essential if they are to meet the end they are meant to serve. Matters will doubtless mend with experience. But in the meantime fiction frequently has more than its due place assigned to it, is made in short the staple fare, while the advantages of linking up

the home reading with the work in History are seldom adequately realised. Class libraries are growing; but there is still a lack of good standard books in many of the schools, and without books scholarship cannot thrive.

Recitation receives a considerable amount of attention. But in connection both with this exercise and with reading aloud there seems to be great room for improvement. I am informed that it is rare indeed to find poetry repeated with real and natural expression, or to find prose repeated at all. Local defects of enunciation and accent are frequently allowed to go uncorrected, and indistinctness of utterance is regarded as a venial fault. As a result, our Inspectors have to complain that whole schools are infected with the pernicious habit of low and inarticulate speech. No doubt self-conscious boys and girls do not take kindly to oral examination by a comparative stranger. And yet with careful and persistent practice it is remarkable what a degree of confidence and fluency can be attained.

As to the written work, I am glad to have emphatic testimony from more than one reliable source as to the prevalence of better methods of instruction in composition, excellence in which art is, of all the fruits of good teaching, at once the most uncommon, the most valuable, and the most difficult of attainment. It is gratifying to be able to say that this testimony is amply confirmed by the evidence of the written papers. In reporting upon these the Chief Examiner remarks :—

"Composition has now reached a most satisfactory level in the great majority of our Scottish schools. The quality of the Composition was by far the most pleasing feature of this year's papers, both in the Higher and in the Lower Grade."

There is, however, another side to the shield. The papers show that, among the younger pupils at all events, little or nothing effective has been done to check the flow of mere irrelevance. Information was repeatedly supplied, not because it was asked for or because it was in any way to the point, but simply because it slipped easily from the end of the pen. In scores of instances marks were lost by the Lower Grade candidates through inattention to instructions or to the precise form of the question under consideration. Nor is the power of interpretation cultivated as it ought to be. It seems to be almost impossible to eradicate the ill-omened associations that cluster round the old-fashioned paraphrasing exercise. In the Lower Grade, for instance, it was this year hoped that by setting a fairly long, yet fairly simple, piece of narrative verse the temptation to verbal reproduction would be diminished. The hope has not been realised; it was heart-breaking to see Scott's charming ballad of *Rosabelle* subjected to the same dull, mechanical, unintelligent process that has rendered Pope and Cowper and Goldsmith abhorred by generations of healthy-minded schoolboys. And apart from this it

appears that many of these "paraphrases," in spite of—or because of—their meticulous adherence to the original, were not even substantially correct. The writers failed to envisage the situation. They did not see that Rosabelle was herself a Saint Clair, and that Lindesay's presence at Roslin was the real attraction; a large proportion thought that the castle went on fire, and that "twenty of Roslin's barons bold" perished in the flames. In the words of the Chief Examiner:

"The general result seems to be that the majority cannot read and understand an unfamiliar poem without guidance. Clearly we must persist with this exercise. We cannot hope for success until paraphrasing books are banished, until it is clearly recognised that 'paraphrasing' is primarily an exercise not in composition but in interpretation, that its most illuminative analogue is the 'unseen' in foreign languages, and that, like the unseen, it needs no special preparation."

The remainder of the Lower Grade paper calls for little remark, although it may be observed that the dictation revealed some weakness in punctuation, more particularly in the use of inverted commas. Parsing was good, analysis not so good.

Turning now to the Higher Grade paper, I find that, in the opinion of the majority of the revisers, irrelevance is this year much less prevalent. The difference as compared with the Lower Grade is due, it may be supposed, to the greater age of the candidates and to their corresponding advance towards maturity and exactness of thought. As has been indicated above, the revisers were unanimous in their praise of the composition. "For the essays," says one, "I have nothing but praise." "Many of the compositions," says another, "were imaginative and original." In brief, by common consent the compositions this year were the best that have ever been done in this examination. The verdict on the question of interpretation presents a marked contrast. With some brilliant exceptions the candidates generally were prone to regard this element of the paper as a mere opportunity for displaying their ingenuity in word-changing. Even when the gist of the sonnet was fairly well caught, the notes were conventional and prosaic. Vague generalities like "very neat," "adds to the description," "heightens the poetical effect" are of course valueless. On the other hand, this was one of the questions where the very best candidates shone conspicuously. Analysis of sentences was extremely good. Etymology, however, was again poor; it is regrettable that so important a branch of language study should be neglected. Syntax was better than in previous years. The passage from Izaak Walton was something of a novelty. It was often chosen, but was not so easy as it looked. The archaic spelling gave little trouble—except to the candidate who interpreted "If the angler take fysshe" as "If the angler take physic"—but many were content merely to modernise this spelling or at most the obsolete words, leaving archaic idiom and sentence-structure untouched. The answers on literature were

fairly well done, although the question on the essayists revealed much ignorance disguised by text-book quotations. The question embodying a series of poetical extracts, each giving a different personification of Death was of course intended primarily for the abler candidates, and some of those who selected it did it most admirably. Others, who could probably have answered one of the alternatives quite well, misapprehended the point entirely; perhaps the wildest guess was that which saw in Milton's King of Terrors the description of a windmill moving its arms at night.

HISTORY.

The year now under review has, I think, seen a real advance with regard to History teaching. The publication of the Departmental Memorandum mentioned above was distinctly useful, if only in that it helped to stir the waters and to direct the attention of teachers to the possibility of improvement in methods. Taken in conjunction with the introduction of a separate History paper in the Higher Grade, it has pointed the way to a more comprehensive study of the subject, and to a much truer ideal of what the successful teaching of History means. Substantial progress is as yet scarcely perceptible, but the evidences of activity are such as to justify a confident expectation of better things. In one respect the effect of the Memorandum has been clearly visible. In many schools time-charts on the plan there outlined, or on a similar plan, have made their appearance on the walls. Unfortunately, however, these usually represent nothing but the business enterprise of the educational publisher; seldom or never are they constructed, as they ought to be, by the combined efforts of pupil and teacher. Apart from this, they tend to err on the side of over-elaboration. On the other hand, little has been done in the way of providing aids to historical study. Books of reference of the right kind are frequently not available, and such means of illustration as "portraits, coins, medals, and historical relics" are almost entirely absent.

Coming now to the written papers, I find that in the Lower Grade the work has been pronounced "barely satisfactory." Chronology was distinctly weak, and the choice of topics that had been dealt with in the History lesson seemed to be far too exclusively military and dynastic. Possibly the publication of a specimen Higher Grade paper had had an unsettling effect on the work for the Lower Grade where the questions are still included along with Geography in the English paper. If so, matters may be trusted to right themselves shortly; we hope to complete in 1910 the change begun this year, and to have separate History papers in both Grades. In the Lower the subject would continue so far united with English as to be reckoned along with it in determining the issue of individual

success or failure. In the Higher Grade it would probably attain to an absolutely independent position. Such a step is indicated as desirable by the promise of improvement which has already followed the institution of a separate paper, and is, of course, inevitable if English—to say nothing of History itself—is to play its proper part in the post-Intermediate curriculum. In the meantime the answers to this year's Higher Grade paper go to show that Scottish History is being studied with avidity, that the classical pupils possess considerable knowledge of the story of Greece and Rome, and that some acquaintance with the great figures of European History begins to be diffused. The most urgent need of the future is a larger output of teachers with the knowledge and the enthusiasm that are indispensable to the proper study of the subject.

GEOGRAPHY.

Much of what has just been said as to History applies *mutatis mutandis* to Geography. The policy we propose to pursue in regard to the papers is identical. And here, too, there are unmistakable signs of an awakening interest in methods. In some instances specially qualified teachers have been appointed, and are doing their best to develop the work on scientific and practical lines. As in the case of History, however, the supply of apparatus is as yet too scanty. There is a lack of maps of all kinds, as well as of photographs and books of reference. Some school managers have not even yet realised that the Ordnance Survey are willing to provide maps for educational purposes at a merely nominal cost.

The Report of the Chief Examiner on the work of the Lower Grade candidates is fairly reassuring; the principal complaint of the revisers is as to the want of method in answering. What he has to say regarding the results of the Higher Grade paper contains so many criticisms of practical importance that I think it well to quote it *in extenso*.

"The first question was done best. Measurements were carefully made, and sections as a rule well drawn. But many pupils showed ignorance or carelessness in the placing of the decimal point, while others wasted time on the calculation of the area by an elaborate formula. They should be taught to verify their results by common-sense, and to be content with approximate answers. The method of projection is to be deprecated for the drawing of sections when the line to be projected is at so high an angle to the base line. The weakest part of this question was in the map-reading properly so called, *i.e.*, in the power to visualise the symbols of the cartographer. This power can only be acquired by practical work in the field. For such work most Scottish secondary schools afford excellent opportunities.

"The second part of the paper revealed plenty of general information, but also certain marked weaknesses. To begin with, there was a general tendency to avoid map-drawing. Again, Scottish Geography was not known as Scottish boys and girls ought to know it. Thus of the few candidates who attempted a map of the Tay valley scarcely one tried to show the edge of the Highlands—surely one of the most conspicuous and important features in the scenery of Scotland. Knowledge of their own neighbourhood, even, could not often be counted on. Once more, topography and

political geography still usurp too large a share of attention, to the detriment of weightier matters, such as climatic causes. Political divisions should be taught after, not before, the climate and build of a country have been studied. Lastly, the information displayed was not always up to date. It must be remembered that Geography is a growing subject. Our knowledge of geographical facts is increasing yearly, and the laws under which these facts are marshalled are gradually being formulated with greater precision. Teachers who desire to keep in the forefront cannot rest content with the Geography they acquired at school or at college."

CLASSICS.

Much sound work continues to be done in Classics. It is to be feared, however, that many teachers of ancient languages have as yet failed to appreciate the great advance that has taken place in the handling of other subjects, and the consequent necessity laid upon themselves of putting more thought into the question of method, if Classics is to maintain the position it has held so long, and held so deservedly, as one of the finest instruments of a liberal education. In spite of the improvement visible in a fair proportion of schools, one is still apt to find undue attention being paid to useless grammatical detail in the earlier years of the course. This applies more particularly to Latin. Repetition is less frequent than it ought to be, and pronunciation is far from being universally satisfactory. Composition is carefully taught; but the baneful habit of setting what is much too difficult is still prevalent to a degree that involves immense waste of effort. The advantages of re-translation are not sufficiently appreciated, nor the extent to which systematic oral practice is calculated to impress ordinary forms and constructions on the mind of the learner. The position is better in regard to Greek, which has the further advantage that it is seldom taken except by pupils of real ability. It is beyond dispute that the standard of scholarship reached in Latin would not suffer if there were a sensible reduction in the number of those who attempt to study it.

A suggestive report prepared by one of the members of our staff has such a direct bearing on what I have just said, and contains so many hints of practical value, that it deserves to be carefully studied. It deals with the teaching of Latin in Intermediate and Secondary Schools, and has been suggested by a survey of the present condition of the subject as seen in the light of the principles laid down in the Department's Memorandum on the Teaching of Languages. I propose to print it in full as an Appendix to this Report.

As regards the written papers, I have received the usual interesting Report from the Chief Examiner who sums up the salient points most clearly. But before proceeding to quote from his remarks, I should like to allude briefly to a weakness of which he makes no special mention, but which has left a

strong impression on the minds of several of the revisers. I mean the neglect to apply the touchstone of common-sense to the translation of unseen passages. In some cases it amounts absolutely to a temporary failure to realise at all that the function of language is to express a meaning, to describe "things." What, for instance, is to be said of the state of mind of a pupil who, seeing before him the Latin sentence, "*Hoc sedato tumultu crebrae continuis diebus concitationes fiebant,*" deliberately proceeds to put down as a rendering of the first six words:—"Having seated himself on a mound of brambles for the following days"? This is not by any means an extreme example, but it is typical. There is no novelty about the phenomenon; it has often been drawn attention to in these Reports, and it is only too familiar to those who have revised language papers in connection with any school examination. But I doubt whether teachers generally are alive to the fact that it is symptomatic of a definite defect in method. It constitutes an unanswerable indictment of the ordinary system of trying to teach a language *through* translation. It suggests that much of what is "read" in schools is not in the least understood by the very pupils who have been made to construe every word of it. Their sight has been focussed upon the forms of language, and they have not been sufficiently encouraged to look through the forms to the sense.

I pass now to the Chief Examiner's Report:—

Lower Latin.

"On the whole, the results appear to be rather more satisfactory this year than last, though this is shown, not so much by an increase in the number of good papers as by a marked decrease in that of papers falling far below the required standard. The translation from Latin into English was, on the whole, satisfactory, which makes it the more surprising that the grammatical questions referring to the text were generally badly done. It seems as if Grammar and Translation were kept too much in water-tight compartments, and many candidates were evidently disconcerted by the demand that they should apply their grammatical knowledge to the text they had just translated. With this very important reservation, the Grammar was the best part of the paper; but one wonders what use Grammar can be to pupils who cannot apply it. Memory work has its value, of course, but only as a foundation for something else. The knowledge of quantities does not yet show any sign of improvement. The worst part of the paper was, as usual, the continuous prose, and it was the chief cause of failure. This would not have been so serious if it had been compensated for by excellence in the sentences, which, however, were poorly done with the exception of the first. The papers leave the impression that continuous prose is often prematurely introduced, and that the stricter drill of sentences is accordingly neglected. It is absurd to expect prose composition from candidates who can write (as very many do) *Dic mihi quem te esse.* The conclusion seems to be that it will be expedient to attach still higher value to the sentences. The continuous prose will follow as a matter of course. It is extremely gratifying to observe that the questions in History and Geography were generally fairly well done.

Higher Latin.

"The introduction of two papers, and the consequent changes in the general type of paper, have proved most successful, and will, doubtless, become more so as the schools get accustomed to them.

"A striking feature of the First Paper was the large number of candidates who chose the passage from Terence, though there is no reason to believe that many of them had read any Terence at school. It is much to be desired that the practice of reading at least one comedy could be revived in our schools. Those who attempted the Horace as an 'unseen' were more unfortunate. He is hardly an author who can be attacked in that way, and the only justification for setting him at all is the presumption that most candidates will have read at least the more important Odes. It appears that this is not so, and the fact is to be regretted. There is still the same weakness in Virgilian vocabulary as last year. Indeed, it is not too much to say that the chief cause of failure all through is defective vocabulary. In the Second Paper, it is noteworthy that the very same defects are to be found in a very large proportion of the papers. In the prose composition these are (1) the use of deponents in a passive sense, (2) misuse of connectives such as *autem*, *quidem*, *tamen*, (3) want of thought as to the precise meaning, leading to such renderings as *putare* or *arbitrari de* for 'think on,' which occur in most papers. In the same sentence 'while' is generally translated by *dum*. This *constantia errandi* points to a definite and remediable defect in the teaching. The Sentences, which are intended to test definite syntactical knowledge and the power of applying it, were not so well done as the continuous prose, which makes no great demands of this kind. This is the natural result of the premature introduction of continuous composition on which I have remarked above. On the whole, however, a steady improvement is to be noted here, and certain constructions are more frequently taken as the matters of course they are. There is a marked improvement also in scansion, and it is clear that more is being done for History and Literature.

Lower Greek.

"The modifications introduced into this paper this year have had satisfactory results. Not only are there more good papers, but there are fewer really bad ones among those that failed to pass. Only 71 candidates out of 508 fell below 30 per cent., a result which, in my opinion, reflects very great credit on the teachers, The translation was in most cases fairly done, and calls for no special comment. The parsing was also fair, except that *προσαγορεύω* was credited with the ineradicable *προσηγόρευσα* and *προσηγόρευκα*. No doubt it is only a convention which prescribes the grammar of a certain period of Attic, but it is a necessary one on educational grounds. It is in every way better for the pupil to be accustomed to *προσεῖπον* and *προσείρηκα*. The other forms will give him no trouble when he meets them in later writers, and certainly need not be taught at school. Comparatively few candidates failed to make respectable marks in the translation of English into Greek. In this respect, the contrast between the Latin and Greek papers is striking. The general questions were well done on the whole, and it is clear that teachers are becoming alive to the need of giving their pupils an outline of ancient tradition, legend, and history. Even the paper which tells us that Theseus "conquered the Amazons of South America" bears witness to an effort in this direction.

Higher Greek.

"Here too there is a marked improvement. In the First Paper the passage from the *Odyssey* was generally well done, though it is remarkable that many candididates could not translate *αὐτὰρ ἐπεὶ πόσιος καὶ ἐδητύος ἐξ ἔρον ἔντο*. This points to the fact that the practice of reading Homer in

masses is not so universal as it should be, though there are other signs that it is spreading. The passage from Euripides was not so successfully done, a fact which seems largely due to the unfamiliarity of the story. The mistakes made in the prose passage were due to want of thought rather than to ignorance of Greek. The General Questions were not remarkably good. At this stage, the pupils ought to be able to formulate some ideas of their own on such questions as were asked.

"In the Second Paper, the Composition reached a high level. It is gratifying to note that Latin uses of the Subjunctive are becoming infrequent. One very weak point, however, is the use of the infinitive in indirect speech after εἰπεῖν and of ὅτι after verbs of thinking. This is a fairly simple matter, and ought to be cleared up. Some popular grammars unfortunately give erroneous rules on the subject.

"In the matter of Accidence, the amount of knowledge required is coming to be more clearly understood.' It is not much, and no words are asked for which are not common in good prose writers. This minimum should be accurately known at all costs. There are still a few schools, however, which burden their pupil with far more accidence than anyone requires unless he is a professional scholar. When asked for an 'aorist infinitive in Attic usage,' some candidates gave three or four aorist infinitives from all periods of the language. It is surely unwise to burden young memories with all this lumber. The syntactical notes are the weakest part of most papers. There seems to be still a great deal of loose and confusing terminology in use. As, however, the syntactical principles are, in most cases, correctly applied, the harm done is not so great as it otherwise would be. It is satisfactory that the question on tragic diction was generally well done. A question of this type involves an important point of method in teaching, and it is encouraging to observe that the object of it seems to be appreciated.

"On taking a survey of the papers as a whole, the question is once more forced upon me as to the reason for the great superiority of the Greek papers to the Latin. It is true, of course, that the candidates in Greek are to some extent selected, but this will not altogether account for the divergence. It seems to be certain that better methods are used in the teaching of Greek, and this makes it very desirable that those of elementary Latin teaching should be re-considered."

FRENCH.

The reports received from the visiting Inspectors are unanimous in their testimony to the sure, if gradual, progress that is being made in French. There could be no more satisfactory sign of the vitality of the subject than the enthusiasm with which the younger generation of teachers are striving to improve their qualifications. The number of those who have not lived at least a short time abroad is rapidly decreasing, and many make a practice of spending a portion of each summer in France. The fundamental ideas underlying the "new method" are also being grasped and applied with firmer hands. In other words, there is evidence not only of zeal and knowledge but, what is at least equally important, of common-sense and judgment. Pronunciation improves slowly, although the characteristic vowel and nasal sounds still present difficulty. More advantage might be taken of Phonetics as a scientific aid in attacking the problems involved; even when a sound-chart has been obtained, it is frequently not used, or not used in the proper way. It is

probably in dealing with classes in the earlier stages of the curriculum that a teacher is put most severely on his mettle. Accordingly these should never be utilised as a training ground for the inexperienced. Apart from the vigilance and the skill that are called for by drill in pronunciation, the selection of the grammatical points to be noted requires the exercise of a nice discrimination and the possession of a sense of proportion as to what it is or is not essential for the beginner to master. The practice of conducting the ordinary work of the class in French is steadily extending. But the pupils are not always trained to ask, as well as to answer, questions in the foreign tongue, and there is sometimes a more or less deliberate reversion to the "old method" when the upper classes are reached. The tendency to use books that are too difficult is not yet eradicated, while the analogous error in regard to composition continues to be productive of much harm. On the other hand, it is evident that more might be done to train literary taste, and to enlighten pupils as to the distinctive merits and qualities of the French books they are studying. Classical authors like Molière and Racine should receive careful attention at the most advanced stages, and pains should be taken to inculcate a due appreciation of the structure of French verse. Of course, the other aspect of the matter—the rapid perusal of masses of easy French—should not be overlooked. Nor is there any reason to think that it is not being attended to fairly well. Indeed, nothing is more encouraging than what our Inspectors have to say regarding the development of home-reading schemes in French among the older pupils. These are rendered possible partly by the wise provision of class libraries, and partly by the surprisingly cheap texts of standard works that are now available for purchase.

The following are among the more interesting of the Chief Examiner's observations on the written work. What he says regarding the Dictation test is worthy of special note. His remarks regarding translation have particular significance in the light of what I had occasion to say above as to the corresponding weakness in the Classical papers:—

"Lower Grade.

"The revisers, with one exception, agree in reporting an advance on last year's performance, and two or three note a marked improvement.

"This favourable impression might perhaps be discounted as due in part to the easiness of the paper set, and partly to the higher average age of the candidates; but after allowing for these considerations, I have no hesitation in pronouncing that there has been progress all along the line. Solecisms are distinctly rarer, and the number of absolute failures has diminished. It still remains the fact that many candidates are presented whom the most sanguine of teachers could not have expected to pass.

"The paper, like those set in recent years, was intended to encourage oral methods, and, except for one rudimentary question at the end, no formal grammar was demanded. The results are a convincing proof of the soundness of the oral method which, in one form or another, is generally adopted

in schools, but they show also that it needs supplementing by written work. In former years the general complaint was the weakness of the French Composition, but this year there was a consensus of opinion among the Revisers that the *version* was worse than the *thèmes*.

"I proceed to comment on the questions in detail. I. The story was, on the whole, creditably reproduced, though the English was too servilely followed. The use of past tenses, an old stumbling-block, had been attended to, and idioms like *avoir beau* were known and correctly used by many. '*Mère, donnez-moi d'eau*' combines three very common faults. '*Un jour quand il faisait très beau*' ('one fine day') is a sample of the letter that killeth, and the uses of *ce* and *il* have yet to be mastered. II. The English translations were, with some brilliant exceptions, lamentably defective in style. Thus, at least half the candidates began:—'The conversation of Balzac was very agreeable,' and continued, 'I think that *it* was composed' (without an antecedent); 'that he would get himself assassinated' for 'that he would be murdered,' was frequent. Apart from defects of style, the commonest faults arose from a disregard of tenses. *Il grimpait* was confounded with *il grimpa, il voulut sortir* with *il voulait*, and the somewhat complicated combination of tenses in the last paragraph was beyond the powers of most. It is, perhaps, useless to note 'howlers' such as 'the quaker of St. Michael' (*le quai de Saint Michel*), or 'the dinner consisted of boiled oxen and a country melon' ('*de bœuf bouilli, d'un melon et de champagne*'); but these were so abundant, that, for the sake of teachers, I may venture to quote a dictum of a former master of Balliol: 'Remember that a translation may make sense, and yet not be right; but that, if it makes nonsense, it must be wrong.' This may be a superfluous counsel, but I would insist on the advisability of setting now and again a passage of French to be translated into good and idiomatic English. To be adequately enforced and corrected the work must be written. It is worth noting that the exceptionally good translations to which I referred came from classical schools where the pupils had apparently profited by such practice, though not *in pari materia*. III. I can endorse one reviser's report:—'On the whole, well done; in many cases, very well indeed.' I have only to note the commonest mistakes:—'One who seemed,' *Un qui* and, not seldom, *on qui*; 'That is not your mother's cow,' *celle* (or worse) *cela, celui*; 'I know her,' *je la sais*; 'Twenty cows,' *vingts de vaches*; 'Such a fool,' *tel un fou*; 'He had been dreaming,' *il avait été rêvant* (or worse) *rêver, rêve*. Not one in a hundred hit on the idiomatic *pas si bête* or *un drôle de garçon*.

"Higher Grade.

"The advance noticed in the Lower did not extend in the same measure to the Higher Grade. Here, too, bad failures were not numerous, but distinction was very rare; there was a dead level of mediocrity.

"The least unsatisfactory part was the dictation. As this was a new test, it was applied under the most lenient conditions, and candidates must be prepared next year for a somewhat stiffer passage, and a shorter allowance of time for corrections. The numerous erasures showed that few had caught the meaning at the second reading; it had gradually been made out by studying the context. Yet, after making due allowance for the easiness of the passage, on comparing the performance with that of English and Welsh scholars of the same age, I can testify that Scottish schools more than hold their own. In the first paper, the set passage for French prose was better done than the paraphrase or free composition. For the latter, the great majority chose the Victor Hugo. The sense of the poem was so plain (except in the last stanza) that few failed to give it after a fashion, but most were content with a line-for-line paraphrase, and very few recast it entirely as a pure narrative, or showed originality by putting it in a dramatic form. The simile of the last stanza was commonly misunderstood, or else the words '*Tels des enfants . . .*' were simply transcribed. This failure points to a defect in the teaching. In reading lessons, especially of poetry, teachers are too commonly content if the pupil can construe each

sentence correctly, and explain any allusion. They do not go on to test whether the general purport of the whole passage or poem has been grasped and appreciated. There can be no better exercise, both linguistic and literary, than an oral paraphrase, at starting with books open, and, as pupils progress, with books shut.

"In the set passage from English into French, false concords and gross solecisms were rare and there was an improvement in the extent of vocabulary. On the other hand, there was general weakness in the syntax, especially in the use of moods and tenses. I again note the prevailing errors. 'He had scarcely finished speaking when . . .' The preterite anterior is in use unknown; *quand* was far more common than *que*, and the prepositional construction of verbs is a neglected point of syntax. 'There's a most impudent dwarf for you,'—*Voila un* (or *le*) *plus impudent nain pour vous* was a typical rendering. The difference of the relative and the absolute superlative should have been familiar to all. 'They are the deepest-dyed villains that ever saw the day' revealed a similar weakness in syntax—*ils* for *ce*, and indicative for subjunctive.

"On question III. (*a*) a high percentage of marks was gained. Few chose the alternative (*b*) and of these few only a fraction showed any real knowledge of French prosody. Attention has more than once been called to the neglect of this branch of scholarship. That every candidate for the Higher Grade should know how to scan a French alexandrine is not an excessive demand.

"In the translation into English the style was almost as defective as that of the Lower Grade. Very rarely was there any attempt to recast the sentences; they were reproduced mechanically phrase by phrase, as it were on a typewriter. Literal construes such as 'but with an excessive love,' 'at each meeting,' 'he would willingly have arrested the people in the street,' 'he had made for himself an English soul'—were the rule. Of actual blunders the commonest were a confusion of *idiome* and *idiotisme* and of *boissons* and *buissons;* of *indigène* with the English 'indigent' and of *troublé* with 'troubled.' From defective punctuation it looked as though many connected the question *Avez-vous lu Baruch?* with what preceded instead of with the following clause. The worser sort who did not see that La Fontaine was a proper name, or so mistook the sense of the whole passage as to render the concluding words 'lands unknown to Shakespeare,' were the exceptions, but numerous enough to be gibbeted. But on the whole the first passage was moderately well done.

"The same cannot be said of the second passage—from Moliére. For the majority it proved far too difficult. It would have been a happy accident if any number had read the *Misanthrope* in school, but some familiarity with the language, and in particular with the inversions of French classical poetry might reasonably have been looked for. It was not to be expected that so hard a nut as '*encore en est-il bien*' would be cracked by many, but all the rest of the dialogue was well within the capacity of an intelligent boy of 17 who had read a play or two of Molière or Racine. As it was, even those who by comparison scored revealed by such renderings as 'it is general,' 'keeps measure with vice,' 'show favour to human nature,' 'by reason of wisdom,' that the meaning was only half grasped. The literary comments (asked for in Question III.) showed the same lack of appreciation. That Philinte and Alceste were mistaken for women is of no consequence, but it did matter that many took Alceste's diatribe as expressing the poet's own sentiments. I did not come across a single reference to Shakespear's Timon, and a quotation of Cowper's 'O for a lodge,' &c., or of Burns' 'Then gently scan,' &c., was a rare treat.

"To sum up, I would say that a sound foundation has been laid but the superstructure is still shaky."

GERMAN.

Several of the visiting Inspectors have addressed themselves to discussing the undoubted eclipse which the popularity of

German has recently undergone. As I have already had occasion to point out, the matter cannot be effectively dealt with apart from the wider question of the organisation of the curriculum as a whole. At the same time it may be helpful to indicate here the more important of the causes which, in the opinion of our Inspectors, are contributing towards the decline. I doubt whether much weight is to be attached to the fact that the number of qualified teachers of German is small as compared with the number well qualified in French; if the demand were equally great, an equally abundant supply would be forthcoming. Nor does there appear to be much force in the suggestion that the initial difficulties of the language have a deterrent effect; the relative simplicity of the pronunciation provides ample compensation for the complication of genders and declensions. On the other hand, it cannot be gainsaid that the inertia of tradition exercises an influence that is very hard to contend against; this is all in favour of French in cases where a choice has to be made. Not less powerful is the sway which University regulations wield over the conditions of work in Secondary Schools. These are the main forces with which Managers will have to reckon in any endeavour to stem the current. Under the circumstances it is greatly to the credit of the teachers that the level of the work done in schools should continue to be well maintained. Where the language is taken up in earnest, the time devoted to it is generally adequate, and the results correspondingly good. The "new method" in more or less modified forms is widely used, and the pupils seem to acquire, in the higher classes at least, the power of understanding spoken German, and, in a fair number of instances, of reading the language fluently without translation. That is no inconsiderable achievement. But it is not one with which we ought to rest content. If the claims of German could only receive the fair consideration for which I have endeavoured to plead, something more might confidently be looked for.

According to the Chief Examiner, the effects of the depression are beginning to betray themselves in the quality of the written papers. He says:—

"The general results of the examination, if not actually below the level of those of former years, certainly show no advance upon them. Under the circumstances, any decided advance in the general attainments could hardly be looked for, even with the most approved methods of instruction; and one has probably to rest satisfied if the results remain what they are, and no further falling off takes place."

One or two other extracts from his valuable Report will be of interest. The following, for example, is significant:—

"In the case of many schools, the grammatical drill is still imperfect—sometimes even deplorable—as was especially evident from the reading of the detached sentences. That good, honest, and even excellent, work continues, however, to be done, even under unfavourable circumstances, is manifest from the fact that the pupils of some of the schools have secured an almost unprecedented proportion of high passes."

Again, his experience as regards the effect of breaking up the Higher Grade paper into two, deserves quotation:—

"The innovation, started this year, of breaking up the single paper of former years into two papers of equal time and value seems to me a decidedly good one, for the reason that it is calculated to relieve the stress on the candidate and to help him to reasonably apportion his available time amongst the different parts of the work."

Finally, his general summary is weighty:—

"Whilst not unsatisfactory, or even more or less creditable, in the case of some of the schools and the pupils they send, one would like to see the work all over of a more uniform character, and of a higher level of quality. Even of those candidates who succeed in reaching the pass-mark, far too large a proportion only manage to get through with difficulty, sometimes perhaps even through the reviser's indulgence and no more. This, surely, is not as it should be. To a candidate of this kind, whose only ambition seems to be to get up as much knowledge as may be supposed to satisfy the examiner, the time spent on German can only have been a time of drudgery, and whatever delight the language and literature may offer to the cultivated mind must be totally lost upon him. It may, indeed, count to him as a 'preliminary' subject for examination, but assuredly it is not a subject of general culture in any sense, and will almost certainly be dropped by him as soon as it has served its purpose."

SPANISH.

The number of candidates put forward in Spanish was comparatively large. All, however, were drawn from a single school, and there was no evidence that any of them had taken up the study out of consideration for a practical end. The country at large obviously remains indifferent to the great possibilities of this language from a commercial point of view. The oral examination suggested that the pupils concerned had been presented too soon; they had been carried too rapidly over the ground without sufficient drill in important details, and the need for repetition and revision was plain. This impression was amply confirmed by the written papers, where the work of nearly all the candidates proved to be unsatisfactory. The translation into English was, for the most part, careless and inaccurate, ignorance being shown of the meaning of the most ordinary Spanish words and idioms. The composition too, was marked by many defects. Among these may be mentioned wrong genders of nouns, mistakes in the conjugation of verbs (especially the irregular verbs), incorrect use of the past tenses, and inability to distinguish between the verbs *ser* and *estar*. Errors in the accentuation of Spanish words were also frequent. The elementary rules of Spanish syntax appeared to be unknown.

ITALIAN.

After an interval of several years there was once more a demand for a paper in Italian. The questions set were of a tolerably testing character, the examination being on the Higher

Grade level. The one candidate who was presented, a girl, did fairly well, falling short of success by only a very few marks. She had clearly been taught with care, and she possessed a certain fluency in the use of conversational Italian. The range of her attainments, however, was limited, while combined with her fluency there was a proneness to fall into blunders of a somewhat elementary character. More drill in the essentials would have been useful. And her reading had hardly been wide enough to justify her in coming forward; there was, for instance, no evidence of any power of literary appreciation. Another year of study would probably have made a great difference. Apart from the results of this year's paper, it may be worth while saying that, with the advent of some degree of specialisation in the post-Intermediate curriculum, it would not be unreasonable to anticipate a revival of interest in this language, so rich in its associations. It is significant that at least one of the Scottish Universities has now a definitely established lectureship in Italian.

GAELIC.

The work done in Gaelic continues to present many gratifying features, and this year there is a considerable increase in the number of candidates. The Chief Examiner reports as follows on the written papers:—

"The results of this examination must be regarded, like those of former years, as very satisfactory. The orthography continues the most, if not the only, unsatisfactory feature. But there is an improvement distinctly perceptible in the best papers, although the large majority of them are in this respect far from what they ought to be. Next to Orthography, Grammar presents the weakest feature. The only question set in Formal Grammar (V.) was a very elementary one. And yet while there were many good answers, several about correct, no fewer than 51 candidates obtained less than 50 marks in this question. The answers to Question VI., notwithstanding the options, were about equally unsatisfactory. Question VII. was much better answered. The first four questions (including the substitutions of VIII. and IX. for II. and III.), which test the capacity for translation and paraphrase from Gaelic to English and from English to Gaelic, and to which were assigned 75 per cent. of the available marks, were on the whole well done. Several failed to master the diction and idioms in Question IX. But the greatest difficulty was with Question I. Many gave a clear account of the scene in good Gaelic. But a greater number owed the marks assigned to them as much to their command of Gaelic diction and idiom as to their intelligent comprehension of the passage. Eight candidates did not even attempt a version, while 27 others obtained less than 50 per cent. of marks for their reproduction of the trial and death of Socrates."

His comment on the geographical area from which the candidates are drawn is very interesting:—

"Of the 20 candidates credited to Inverness (mainland), 15 were examined at Kingussie School. Some of these, probably the majority, are evidently from the Isles. Sutherland sends only two candidates, both from Lochinver. There is only one candidate from the Western

seaboard between Gairloch and Easdale. There are none from the mainland south of Ballachulish and Easdale, none from the Islands of Gigha, Jura, Colonsay, Mull, Iona, Coll, Eigg, Canna, Rum, Raasay, Benbecula, or Barra."

It must not, of course, be forgotten that, in connection with Gaelic, the oral part of the examination is of more than ordinary importance. We endeavour to satisfy ourselves that every candidate possesses a *bonâ fide* speaking acquaintance with the language, and at the same time to secure that he has gone through a course of reading on systematic lines. The latter condition is the one which, for various reasons, it is more difficult to insist upon. But, on the whole, we have no grounds for being dissatisfied with the endeavour which teachers are making to comply with our requirements.

MATHEMATICS.

There can be no doubt as to the general efficiency with which mathematical subjects are handled in the schools. As a rule, the teachers are well qualified in point of knowledge, while the great majority work on modern lines with very satisfactory results. Methods, too, are steadily improving. Under the influence of the Leaving Certificate Examination the water-tight doors that used to divide the various branches of Mathematics from one another are slowly yielding to the pressure of more enlightened and more fruitful ideas. In some of the larger schools, however, the process is sadly hampered by a survival of the old-fashioned tradition which assigned Arithmetic to one teacher, Algebra to another, Geometry to a third, and possibly Trigonometry to a fourth. This is a serious blemish in organisation. If it be accompanied, as it occasionally is, by the want of any common supervision, it becomes positively culpable. It has the unfortunate effect of destroying the homogeneity of the pupil's mathematical training and of rendering it difficult for him to obtain a satisfactory outlook on Mathematics as a whole. I am glad to say that, taken altogether, the reports of the visiting Inspectors are decidedly encouraging. A few points of criticism may be singled out for mention. In Arithmetic one still finds here and there the study of repeating and circulating decimals occupying a good deal of the attention of Intermediate pupils in the first and second years of their curriculum. On the other hand, the idea of approximation and contracted methods of multiplication and division are seldom introduced until near the close of the third year, a postponement that is surely most uneconomical in view of the opportunities for the practical application of these methods afforded by the Science course in the first and second years. Again, Algebra seems to suffer beyond its fellows from the fallacy of isolated treatment. Two or three different reports complain of its being taught in an antiquated, mechanical way, with little regard to its connection with Arithmetic and no

correlation with the work done in Geometry and Science. Once more, the complete value of a carefully graded sequence in Experimental Geometry is not yet properly appreciated everywhere. This weakness is to a large extent due to a rigid adherence to some selected text-book, without any effort to develop independently a reasoned series of connected exercises. Finally, in all branches alike there tends to be a lack of equilibrium as between the experimental and practical element, on the one hand, and the demonstrative and theoretical, on the other. Still, clearer conceptions of the ideal relation between practice and theory are undoubtedly making headway. It is where the two are firmly linked together and directed towards a common end that the highest results are obtained. In the meantime it is good to be assured that—

"The teachers are unanimous in testifying to the greater interest shown by the pupils in Mathematics since its practical side has been developed, and all but unanimous in declaring that the change has led to a more intelligent grasp of theory."

It is pleasant to find that the testimony of those who have revised the written papers is at least as cordial as that of the visiting Inspectors. Some of the comments, coming as they do from men who have worked for us over a long series of years, are particularly valuable as confirming what has just been said regarding the steady advance that is taking place. As usual, I quote the main part of the Chief Examiner's Report :—

"In drawing up the mathematical papers care is taken to avoid unnecessarily complicated questions. Special attention is given to the elementary parts of the subjects, as experience has shown that the great danger in mathematical teaching is neglect of the groundwork in the effort to make rapid progress. The results of the examination have this year been very gratifying. There is a remarkable unanimity of opinion among the revisers that in the large majority of the schools the mathematical teaching is sound and intelligent and that a very satisfactory proportion of the scholars have obtained a good grasp of the elementary principles. As a rule, the proofs of theorems are written out clearly and well, and very considerable success is attained in the solution of problems. The encouragement given to the use of instruments and graphical methods has been fully justified by the character of the diagrams, and it cannot be doubted that the habits of neatness and accuracy, which have been formed by the candidates, will be of great value to them in after life.

LOWER GRADE.

"I. As last year, this paper proved well suited to the attainments of the candidates, and a large number were able to obtain a satisfactory percentage of full marks. The work was generally clear and legible, and the diagrams were drawn with care and accuracy. In cases, however, where the dimensions were not given in the question, many candidates adopted too small a scale, and in measuring angles in order to construct equal angles too small a radius was generally used. Many used the protractor for this purpose, but this practice does not lead to accuracy and should be discouraged. Construction lines were not always properly shown, and the description of the construction in words was too often omitted. Many candidates failed to recognise that the equality of a parallelogram and a rectangle on the same base and between the same parallels is a fundamental

proposition, and attempted to prove it by means of propositions regarding triangles, which can only be regarded as its corollaries. In cases where the dimensions were given in inches, more use of the ruled paper would have saved candidates much trouble. In some schools angles were named by a single Greek letter, often carelessly written, an unsatisfactory practice, which gave trouble to the revisers and should be avoided in future.

" II. A large proportion of the candidates showed a sound grasp of the principles and practice of algebra as far as the standard of this grade. The writing and arrangement were generally satisfactory, and special praise is due to the neatness and accuracy of the graphical work, although in a good many cases the axes and origin were not clearly shown, and explanatory notes were meagre or wanting. Equations were generally well solved, but the verifications of the solutions were often unsatisfactory, either from failure to verify the original equation or from omission to deal with each side separately. It was noted with regret that in many cases, where a wrong solution had been found to an equation, the failure of the verification did not lead to the detection of the original error. Many candidates wasted time by employing other methods in cases where a particular method was required by the question. There are still some schools in which the detailed work is not given in its proper place in the answer, but is written at one side, or struck out by the pen, a breach of the instructions which necessarily causes loss of marks.

" III. As a rule the arrangement and style were good, and the majority of the candidates were able to solve nearly all the questions asked. There are, however, still a good many schools in which due care is not taken to give the reasons for the various steps and to exhibit the detailed working as an integral part of each answer. Curious errors occurred occasionally, showing that candidates used processes whose meaning they did not fully understand. In a question on the division of money, very many had no idea in what unit the remainder was expressed, and were thus unable to state its amount. In vulgar fractions, much time was wasted from failure to simplify each fraction before addition, and also from not finding the *least* common multiple of the denominators. Powers of ten were misunderstood or miscalculated in connection with decimal fractions. Comparatively few were able to find an answer 'correct to two decimal places.'

Higher Grade.

" I. The work was generally neatly written and well arranged. Geometrical constructions were as a rule well done; but only a few candidates used the square-ruled paper for the case in which, the measurements being given in inches, its use would have been specially advantageous. The book-work was generally well known; but, in the solution of riders, it was not uncommon to assume tacitly the proof of the point to be proved, as when it was required to show that three points lay in one straight line; while candidates failed to notice that they had not made use of all the given facts. In some cases steps of the proofs were omitted. The question on solid geometry was seldom well done, and was wholly omitted in some schools.

" II. As a whole the work was satisfactory, giving evidence of careful and intelligent teaching of algebra. Simple equations were well solved, but formulæ were too often used for the solution of quadratic equations. In many cases there was insufficient explanation. This was particularly the case in the graphical work, which was otherwise very good. A problem about two riders with different rates was well thought out, and satisfactory solutions were obtained, either arithmetically, algebraically, or graphically. In arithmetic, weakness was shown in compound interest; and while some used logarithms with intelligence, others made errors which seemed due to an insufficient grasp of the principles involved. There were also a good many who showed great want of thought in calculation of volume, often taking a cubic metre as equivalent to 100 cubic centimetres.

"III. There was a very satisfactory number of excellent papers, showing that in the great majority of the schools trigonometry is well taught. The practical calculations were generally well done, and only a few sent in obviously absurd answers. Some of the diagrams were very good, others were on too small a scale. Inaccuracy occurred in the measurement of angles, and was occasionally caused by the use of too blunt a pencil in drawing the figure. In the proof of the formula for the expansion of $sin\ (A - B)$ errors were often made, which seemed due to the proof having been learned by rote. The question on circular measure was seldom well answered. Few candidates seemed clearly to understand that the circular measure of an angle is the ratio of the arc to the radius. A good acquaintance with the use of logarithmic tables was shown; but such statements as $xy = \log x + \log y$ were too common; and considerable weakness was shown in dealing with negative characteristics.

ADDITIONAL SUBJECTS.

"*Elements of Dynamics.*—The marked advance noted last year was well maintained. Of the candidates examined, very few were without some grasp of the subject, and many gave evidence of good teaching. All the questions were as a rule attempted, and in most cases this was done with a satisfactory measure of success, although weakness was shown in the proof of the formula $v^2 = V^2 + 2gs$, in riders involving calculation, and in the explanation of the action of the syphon.

"*Geometrical Conics.*—The bookwork questions were generally well and neatly written out, and a fair number of the candidates were successful in the solution of one or more riders, but the work as a whole did not reach a very high standard, except in the case of a small section of the candidates.

"*Analytical Geometry.*—The work was as a whole excellent, and reflected credit on all concerned. The subject appeared to be, as a rule, well understood, and the answers were not only worked accurately, but were neatly, fully, and clearly written out. In some cases, however, there appeared to have been attempts to learn by rote such formulæ as that for the equation of the tangent to the general conic. Such a practice is much to be deprecated, and should be discontinued if the present high standard is to be maintained.

"*Higher Dynamics.*—The subject appears to have been taught systematically and intelligently in the majority of the schools, a considerable proportion of those examined showing a satisfactory grasp of the leading principles. Problems were in most cases well dealt with; the work in this respect being distinctly better than the reproduction of standard theorems. In a good many cases there was a tendency to cut proofs short by omission of necessary explanation of symbols, statements of construction, and steps in the reasoning. A small section of those presented had evidently failed to obtain any proper grasp of elementary principles."

SCIENCE.

The publication of the Department's Memorandum on the teaching of Experimental Science renders it unnecessary to refer in detail to the general principles which should underlie the instruction given in this subject in our schools. It will suffice to touch briefly on some outstanding features of the recent examination, and to note one or two conspicuous faults to which our Inspectors and Examiners direct special attention. It is very gratifying to be able to report a feeling of increasing confidence in the mark, or at all events in the order of merit, submitted by the teachers; there were still cases where sufficient

care had not been taken in the adjustment of the lists, or where experience in marking had been lacking, but these were quite exceptional. There is also a consensus of opinion as to continued improvement in methods, as to enthusiasm on the part of the teachers, and as to growing interest on the part of the pupils. Taken as a whole, Experimental Science studies seem to be settling down into well-arranged and well-conducted courses of suitable work. At the same time there were disquieting signs, in not a few cases, of a desire to overload the programme unduly, and to aim at covering too much ground; the undue haste which inevitably results is certain to obscure the real value of experimental work as a medium for stimulating intelligence and the spirit of inquiry. The remedy is, of course, to reduce the syllabus—to attempt less and to do it more thoroughly. This is a change which might obviously be carried out in some schools with great advantage. In connection with the point at issue I may cite some wholesome criticisms which have been received from one of our external Examiners. He says:—

"Frequently too much ground has been covered to give the best intellectual training. Discussion of phenomena should be fuller and slower; should give more attention to the pupils' own notions, and should lead to a definite proof of their truth or falseness, or to a clear perception of an unsolved difficulty. . . . Few pupils showed any real power to investigate such simple problems as the action of heat on a given substance, or the action of a given acid on a given solid. . . . In the teaching of Botany, again, there is too much telling and too little training of the powers of observation and deduction. Before teaching the pupils the microscopic characters of stems and roots, it would, I think, be well to see that they know those that can be seen by the unaided eye, or with the help of a simple lens only."

With these remarks there will be general agreement. It need only be added that there should be frequent discussion and comparison of results, and that, while there should be constant revision throughout the course, that revision should always be informal. It should never be the mere repetition of experiments previously accomplished successfully and recorded, a kind of mechanical drill that is not only useless but mischievous, tending as it does to kill all genuine interest.

The prevalence of some of the faults animadverted upon above, notably the overloading of the Science programme, points to the desirability of extending the time for study where a pass in Higher Grade is desired. Concurrently with this the practice of "Endorsement" would be abolished; in any case it is an anachronism now that Honours in other subjects have disappeared. The changes thus foreshadowed will be important, and will probably entail some modification of the existing requirements as to the Junior Student's Certificate. While, therefore, they are at present under consideration, and while a preliminary announcement regarding them will probably be made ere long, they will not come actively into operation until the Examination of 1910.

DRAWING.

There is a slow but clearly perceptible rise in the standard of the work done in Drawing, and in most schools highly creditable results are now obtained. It would appear as if we were beginning to reap more fully the benefit of the better arrangements for teaching the subject in the Elementary Schools. There is also a general improvement in the accommodation and equipment for Art instruction. The advance in the character of the work of the pupils is quite striking in those schools where, with a competent teacher previously working under adverse conditions, a change has been made to an adequately fitted room with proper lighting. It may be noted that Art Masters are inclining more and more to lay stress on tone studies in pencil, and work in water-colour. This is as it should be. The value of good, strong tone study cannot be over-estimated, and it is to be hoped that care and thought will continue to be devoted to its development. The following extract from the report of one of our most experienced Examiners deals with some points that deserve to be carefully weighed :—

"Improvements in methods of teaching are well sustained. There is less of the tentative and irresponsible trial-sketching that formerly prevailed, and construction lines are fast disappearing. Greater freedom in handling pencil and brush might, however, be expected, and all unnecessary turning of the paper to suit the hand while drawing should be avoided. Too much time is still spent in obtaining a reasonably correct drawing, largely the result of lack of confidence in estimating the relation of objects to one another, and, at a later stage of the study, owing to non-appreciation of tone values. Perhaps the least satisfactory part of the work is found in the drawing of apparent angles and the realisation of horizontal plane surfaces, when groups of fashioned objects are being represented. The cause of this lies greatly in the common and quite indefensible practice of drawing any object with plane surfaces, such as a box or book, before more central and important objects, even when the former are hidden from sight. This procedure is largely a relic of the days of 'model drawing,' when the drawing board, forming the base of the models, was commonly drawn first.

"Whenever possible, the pupils should be encouraged to set their own groups, subject to the criticism and advice of the teacher. By this means, useful lessons in the tasteful selection and arrangement of material may be given, the initiative of the pupils developed, and their interest more closely allied to their study. And it has other advantages, especially in those schools where the teachers have a series of stock subjects for representation from which they seem loth to depart. The gamut of combinations possible in the arrangement of a book and a bottle is not so large as to warrant a teacher repeating these, or other similar groups, an indefinite number of times. Pupils can hardly be expected to feel much interest in their work under such conditions, nor are their best efforts elicited."

It will be remembered that there was this year, for the first time, an examination in Higher Drawing. The experiment has been a distinct success. The average standard reached has been sensibly higher than in the case of the former "Endorsement" candidates, although the difference is perhaps not so clearly marked as might have been anticipated. I have only to add that changes similar to those

hinted at in connection with Science are under consideration for Drawing also, and for similar reasons. They will not, of course, become practically operative till 1910, although we hope to be in a position to put some statement of them before Managers and teachers very shortly.

COMMERCIAL SUBJECTS.

So far as the country generally is concerned, any interest there may be in the teaching of Commercial Subjects flickers but feebly. This year, for instance, not a single candidate took the paper in Commercial French or that in Commercial German. In one or two of the largest schools we have recognised special curricula, and in these some first-rate work has been done by a mere handful of pupils. Elsewhere, the suggestion that the matter should be taken in hand seriously has been sufficient to divert the energy of the aspirants along a line of less resistance. Of course, that is not as it ought to be. But matters will never be put on a really solid basis until business men give the whole problem much more earnest attention than it receives at present from any but the very select few who are familiar with what our most formidable rivals in trade find it well worth their while to do for the training of the future merchant.

A further reduction was observable in the number of candidates taking Book-keeping and Commercial Arithmetic. The work, however, was distinctly above the level formerly attained. This is only natural in view of the condition now operative, under which no pupil can be presented in these specialised subjects unless he has previously passed in Lower Mathematics. I append the Chief Examiner's Report :—

"*Book-keeping.*—The general character of the work was good, showing a sound grasp of elementary book-keeping. The standard reached by the candidates showed a satisfactory advance on that shown in previous years. Style and writing were fair, and showed improvement as compared with former years. A special feature of this year's paper was that candidates were required to rule certain books. The result was rather disappointing, and it was evident that such ruling had not been sufficiently practised.

"*Commercial Arithmetic.*—The work was, as a whole, good, and was generally clearly written out. The first paper, consisting of mental calculations, was well answered, although there were too many mistakes in addition. In the second paper, the question on the metric system was well answered. The distinction between interest and discount was clearly understood, though not always well expressed. In a question involving the calculation of discount, the answers were very fair. Few candidates, however, understood what is meant by paid-up capital and the interest thereon. The meaning of compound interest was satisfactorily explained."

PHYSICAL TRAINING.

I have little to add to what I had occasion to say last year with reference to Physical Training. Progress in this important subject is necessarily slow, partly owing to the fact that experts are not yet in complete agreement as to method,

partly on account of the dearth of properly qualified instructors. That there has been genuine progress is nevertheless unquestionable. The difficulty as to instructors is being surmounted by combination on the part of School Boards, and, in some instances, by the enterprise of County Committees, who have employed a skilled person and given various Boards within their area the benefit of his or her services. There are other special subjects to which a similar system of friendly co-operation might, with great advantage, be extended. As to method, it is probable that for some time to come there will be differences of opinion regarding details. Certain broad principles, however, can already be discerned. The only one that need be emphasised here is the fact that any school system of Physical Training must be largely corrective, and that it is accordingly advisable to secure, wherever possible, the benefit of medical co-operation.

In accordance with the usual custom, Statistical Tables are appended to this Report, providing a concise view of the manner in which the various funds available for the support of Higher Education have been administered during the past year.

In 1909, the Written Examination will commence on Tuesday, March 30th. The printed papers will follow the model of those set in 1908.

I ought to add that it has not yet been possible to reach a definite decision as to the desirability of instituting an Examination in Music on the lines indicated at the end of my Report for 1907. We would welcome expressions of opinion upon this point from School Managers who are interested.

I have the honour to be, &c.

J. STRUTHERS.

To the Right Honourable
the Lords of the Committee of Council
on Education in Scotland.

APPENDIX.

Report on the Teaching of Latin in Intermediate and Secondary Schools.

The standard *Pronunciation* authoritatively recommended by the Classical Association should now be adopted in all schools. Most of the schools in which any change was required have already altered their style of pronunciation in the manner recommended, and the few which have not yet done so should lose no time in following the example of the majority. The advantages of a uniform standard pronunciation are obvious, and do not require to be insisted upon.

The question of *Quantity* is one which calls for serious consideration. If the quantities in a passage are rendered wrongly, or merely in a fashion vague and undetermined, the true rhythm of the passage, in prose as in verse, important always for the style, often for the sense, cannot be properly felt. In this respect considerable looseness is still found in spite of the real progress that has been made. As a rule, formal scansion is sufficiently well known; in fact, it is a question whether a purely formal exercise of this kind is not sometimes pushed to extravagant lengths. It ought not to be necessary for a pupil to overlay many hundreds of lines with scansion markings in order to understand a simple metrical form, while, if the object desired is knowledge of quantity, the method taken is hardly to be recommended. The object aimed at could be better and more simply attained by insisting on every sound being consistently pronounced from the first in the clearest and distinctest manner possible. This means that all dubious half-sounds ought to be proscribed as well as more obvious breaches of the rule, and that each individual sound, both in speaking and in reading, should be much more clearly marked with its proper quantitative value than is usually done in English. The method indicated, consistently pursued, would secure the accuracy desired without involving more than a small part of the trouble implied in teaching a good French accent. An inversion of the natural order of procedure seems involved in the manner in which the subject is so often attacked. The pupil, instead of knowing his quantity beforehand, is expected to determine it from a metrical analysis of the line, whereas, if the knowledge of the word and its quantity formed, as it should, but one thing in his mind, the nature of a given measure would in some cases emerge spontaneously in the pupil's natural reading of the passage.

In *Construing*, the renderings should be as true to the original as is consistent with their being in intelligible English, and the natural order of words in the Latin sentence should, as far as possible, be observed. Some simple change like substituting

the passive for the active is often sufficient to secure this object. The English obtained in this way should be good enough for all practical purposes, but the chief advantage of the plan is that, by taking the ideas in the order in which they are naturally developed by the Latin author, confusion is obviated and time is gained. The pupil takes in the sense of a complicated passage more readily in this way than if he followed the time-honoured prescription of starting by first finding the subject in one part of the sentence and then looking for the verb in another. The sense of a complicated passage of Latin can also often be helped out by the teacher's manner of reading it. In an elaborate passage of Livy the difficulty is rarely due to the thought, which is seldom subtle. It is caused chiefly by the trouble which the mind has in distinguishing between the main fact described and its train of accessories and qualifications, and, in a minor degree, by the manner in which, from the freedom of the Latin order, terms or groups of terms may be distributed at discretion all over the sentence in such a way as to echo, answer, or oppose each other.

The mutual relation of parts in such a sentence could often be helpfully brought out by a proper distribution of emphasis in reading, by varying the tones so as to indicate the existence of oppositions and correspondences of the kind described, and generally by passing lightly over certain parts of the sentence and bringing others into stronger relief.

In the earliest stages translation, eked out by the briefest hints, might be employed in such a way as to reduce materially the need for abstract explanation of words, cases, &c. Time could probably be saved in this way—a valuable consideration in view of the paramount importance, for progress, of reading widely—and, in any case, the bare abstract comprehension of a given construction or function is practically less effective than the instinctive feeling for its force insensibly formed by repeated experience of its use. The power of reading Latin is a habit of mind formed above everything else *by* reading; consequently, while the disciplinary value of the formal and more purely intellectual sides of the study is not to be underrated, these should not be so much in evidence as to retard the course of the reading, which ought in every case to be pushed on as rapidly as circumstances will permit.

A further step in the direction of effective concentration of effort would, it seems likely, be represented by the practice of treating the text not merely as the natural medium in which to learn the syntax, but as the regular source of supply for the materials required in sentence formation and simple composition. This line of attack, which is not without its dangers, is rarely attempted, though in one Secondary School at least in the West it has been followed with every appearance of success. The teacher in question starts reading as soon as the regular verb has been mastered—a collection of the simple familiar letters

of Cicero is the work taken up—the attention of the pupils from this point onwards being concentrated exclusively on the book read. Grammar and rules of syntax are learned directly from the text, from which all the materials for daily themes and composition exercises are also drawn. The note-books of teacher and pupils showed many hundreds of typical sentences gradually accumulated in this way from the text of the author studied. Judged by results, the method mentioned bore some very decided marks of success. In particular, the amount of reading which the teacher manages to get his pupils through is worthy of remark. A profession which embraces the whole of Cæsar's Commentaries in a single session must be regarded as exceptionally wide for a class in its third year of Latin and in the second year of the Intermediate Course. The special facility shown by these pupils in dealing with unseen translation is only what is to be expected as the result of their reading. Whether such an exceptional extent of reading is essentially connected with the particular form of procedure followed is another question; if it is, the method in question has a good deal to say for itself. It may perhaps be noted in passing that the practice of the teacher mentioned incidentally raises the question of the choice of a course of reading. The rule in this matter probably is to change an author when the pupils have begun to be a little familiar with his style. It is not certain, however, that it would not be a good thing to continue reading an author, just because the pupils have begun to be familiar with his style. The point is at least worth considering.

When exact translation of the kind previously described does not meet the needs of the case, it should be supplemented by carefully prepared and consequently brief and pregnant comment on the meaning of characteristic Roman terms. The conventional equivalents of many such terms, both abstract and concrete, *e.g.*, *imperium*, *magistratus*, *pietas*, *gravitas*, are apt to be inadequate or misleading. In all such cases it is the meaning, not the name, that matters, and while there is no need to discard the usual English synonyms, the pupil has missed the right point of view if the *notion* conveyed by the word has not been made clear to his mind. In this connection it is interesting to note the practice followed, it is understood, by certain professors of standing in France. These teachers find it expedient to require some sort of genuine French equivalent for the terms referred to only in the case of the more elaborate literary versions which the pupils are set to do from time to time at home; in ordinary class translation, employed merely for purposes of interpretation, it is their custom to retain the Latin form of the words unchanged.

The construing lesson should be terminated, as is recommended in the Memorandum, with the reading of the Latin. If any profit is to accrue from this exercise, it must be performed in a careful and intelligent fashion. From the more advanced

pupils reasonably expressive reading might be required, while intelligent phrasing at least ought to be insisted on at all stages. The importance of the latter point is habitually overlooked. Too frequently even fairly advanced pupils betray, by their style of reading, that they are thinking little of the Latin; the thing, if any, engaging their attention is not the sense in its Latin dress but the English in which it is to be clothed. This is not as it should be. There can be little doubt that the neglect of proper reading means the loss of an important aid to the formation of that instinctive feeling for what is right in speech, which it is the one great function of language training to develop. "Never translate" was the recommendation of the late Professor Nettleship. It was primarily addressed to comparatively advanced students, to whom it still remains a valuable and timely reminder. The dictum, however, has a bearing beyond its original scope. In stating the method of the later stages it indicates the end of the earlier. The great object, that is to say, of work at this stage is to bring the pupil to the point at which translation may in ever increasing measure be dispensed with. There seems no reason why this end should not be accelerated and the way for it paved by a modification of current methods on something like the lines indicated. Something, at least, it is felt, might be done to modify the tendency, unavoidable to some extent in practice, of reducing the reading of a Latin book to a series of exercises in construing and syntax analysis.

The intensive or observational reading which is carried on in some schools is in harmony with the spirit of the precept mentioned. From this to working up the given material in some informal kind of exercises is but an imperceptible step. A prolonged series of such exercises methodically arranged, with due regard to sequence and proportion, would simply mean, if the exercises were detached from their original context, a composition book of the usual type; and an independent text-book of this kind is, as a matter of fact, the means conveniently employed by almost all teachers, who find it either inadvisable or unnecessary to build up for themselves a satisfactory substitute in progressive contact with the text. Composition in some form or other represents a side of the work to which all due attention must be paid. The value of the training is not in itself to be despised, while it can hardly be doubted that merely to understand a language properly a certain practice in handling it is also required. The manner of meeting this requirement is fairly uniform and has been already indicated. A number of teachers, it is true, encourage, and with good results, the direct study of expression in the reading book, though in their case the use of the Composition Manual is seldom or never merged completely in the text; but the usual medium, and, possibly, on the whole, that which it is

most expedient to employ is the ordinary Composition Book. How, then, should the Composition Book be handled?

The method of dealing with it in the beginning, and for a period more prolonged than is commonly supposed, should be mainly, if not exclusively, oral, as opposed to written. Apart from the fact that the value of written work is apt to be affected by the uncertainty of the conditions under which it is done, it is probably, at this stage of the language, both less productive and less accurate than good oral teaching. Thoroughness of a kind that almost necessarily implies intensive oral work is indeed the ruling aim within the limited field of commonly recurring forms and expressions to which this exercise is clearly restricted. Promptness and accuracy in reply should be sought for above everything else in this branch of the subject. The pupil should not only know what he is supposed to know, but his knowledge should be immediately available, such readiness being, in fact, of the essence of his knowing it really well. He is not faced with a mathematical problem; he is not even required to turn out a piece of real prose composition. His whole task is to state the Latin for some few simple words and have done with it. No proper purpose can be served in such a case by reflection or hesitation, and the pupil's knowledge of any specimen of the simple phraseology in question can certainly not be regarded as complete, until he has passed the common stage of having to beat up its scattered elements laboriously one by one in his memory. The immediate evocation of a complete phrase, however simple, as opposed to a string of single terms, is the natural end to aim at. As the unit of speech, the phrase, in this branch of the subject, should also be as far as possible the unit of work.

A practically effective knowledge of essential forms and terms within the range indicated would in time make the pupil ripe for continuous prose composition. No undue haste, however, should be shown in passing from the one stage to the other. Nor should the introduction of written composition involve *ipso facto* the discontinuance of oral. The free use of orally done composition should still continue; indeed, it is possible that the best part of the work in composition in the case even of advanced classes might still continue to be done in this form. Nor in regard to continuous written composition does it seem advisable that the type of exercise regularly set at any stage, even the most advanced, should be really stiff. To perform this type of exercise with any real advantage to him who does it requires a depth of knowledge and of reading that can scarcely be looked for even from an advanced pupil in a good school, and the learner by vainly trying to grapple with such tasks, independently of the necessary equipment and resource, is but committed to a round of barren formalism,

which consumes his time without adding materially to his command of the language. Decidedly more satisfactory results can be got in a natural way by simplifying the type of exercises set, and increasing their amount, apart from the fact that the time unprofitably spent on unduly difficult prose would have represented pure gain if it had been devoted to extra reading. It is in this way that the genuine knowledge which is a condition of further progress is communicated. For a pupil, however, to attempt serious writing in the language before he knows it, must be largely a waste of time. After his general knowledge has been raised to the required level by reading and practice in fairly simple exercises, he will be in a position for dealing successfully with difficult composition, whether at school or later. Prior to that stage, work of the kind deprecated is premature, serving to retard rather than hasten the time at which it can profitably be entered on.

1906-

Statements of Income, Expenditure, and Liabilities of Secondary Schools sharing in School

INC

No.	NAME OF SCHOOL. (*Under the Management of School Boards.*)	Balance (if in hand).	Contributions payable from Common Good of Burgh or other Funds administered by Town Council.	Endowments.	School Fees and Books Sold.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Aberdeen, Girls' High School	135 9 8	84 8 4	—	3,149 6 0
2	Aberdeen Grammar School	310 19 1	419 15 10	164 0 0	2,318 8 6
3	Arbroath High School	478 8 9	75 0 0	290 0 0	756 12 11
4	Ayr Academy	—	95 0 0	57 14 1	1,975 12 0
5	Brechin High School	529 13 8	30 0 0	—	393 12 1
6	Callander, McLaren High School	446 15 4	—	350 0 0	—
7	Dumfries Academy	66 14 5	140 0 0	154 9 1	1,961 7 8
8	Dunfermline High School	1,374 7 9	130 16 8	—	1,076 14 9
9	Duns, Berwickshire High School	465 4 1	—	—	277 0 1
10	Edinburgh, Royal High School	—	717 17 3	17 12 6	1,967 6 8
11	Elgin Academy	770 4 7	130 12 6	26 6 10	515 2 6
12	Falkirk High School	—	—	100 0 0	429 16 1
13	Forfar Academy	438 18 1	200 0 0	169 17 10	329 12 6
14	Galashiels Academy	530 9 5	—	—	279 16 6
15	Glasgow High School	—	570 0 0	—	5,473 17 2
16	Glasgow High School for Girls	—	—	—	4,585 9 2
17	Govan, Hillhead School	—	—	—	910 15 0
18	Greenock Academy	1,572 4 4	145 0 0	43 8 4	2,051 12 6
19	Haddington, Knox Institute	289 14 4	42 15 0	80 0 0	227 12 2
20	Hamilton Academy	7 18 9	—	—	1,347 10 7
21	Irvine Royal Academy	1,105 6 7	115 0 0	—	1,142 7 2
22	Kelso High School	113 2 10	—	—	415 7 0
23	Kirkcaldy High School	2,955 5 9	114 0 0	189 7 2	769 16 0
24	Kirkcudbright Academy	—	224 9 2	200 0 0	220 3 6
25	Linlithgow Academy	—	—	59 6 0	338 17 6
26	Montrose Academy	93 8 7	180 0 0	67 1 5	999 11 6
27	North Berwick High School	536 1 6	—	—	139 16 0
28	Paisley Grammar School	1,316 0 3	60 0 0	99 15 0	1,345 13 5
29	Peebles High School	20 7 7	100 0 0	—	161 16 6
30	Perth Academy	—	271 14 0	161 12 6	2,687 10 6
31	Stirling High School	1,347 14 0	226 17 4	483 15 4	1,935 13 10
32	Stranraer High School	789 14 9	145 0 0	—	471 16 6
	Carried forward	15,694 4 1	4,218 6 1	2,714 6 1	40,655 14 3

1907.

the Grant under the Minute of 27th April, 1899, in respect of the last Financial or Year.

OME.

Grants from Committees of Burghs and Counties for Secondary Education under § 2 (1) (*b*) of Education and Local Taxation Account (Scotland) Act, 1892.	Grants from Scotch Education Department under Minute of 27th April, 1899.	Grants from Scotch Education Department for Science and Art.	Payments out of the School Fund.	Loan raised for Enlargement of School.	Interest on Bank Deposits.	Other Sources of Income.	Total Income.	No.
£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	
500 0 0	850 0 0	251 4 2	1,730 19 2	—	—	68 11 10	6,769 19 2	1
500 0 0	850 0 0	461 0 4	2,719 19 10	—	—	126 16 3	7,870 19 10	2
300 0 0	750 0 0	389 4 2	856 2 11	—	—	—	3,895 8 9	3
791 5 0	700 0 0	—	653 1 8	7,500 0 0	3 8 1	201 5 10	11,977 6 8	4
300 0 0	550 0 0	196 15 6	380 0 0	—	1 2 10	26 2 6	2,407 6 7	5
37 19 6	400 0 0	118 10 7	124 11 8	1,800 0 0	3 7 3	—	3,281 4 4	6
611 4 9	850 0 0	244 13 4	803 7 6	—	—	16 18 0	4,848 14 9	7
366 0 0	750 0 0	771 12 2	100 0 0	—	—	212 16 3	4,782 7 7	8
900 0 0	400 0 0	84 3 6	—	—	—	115 11 0	2,241 1 88	9
850 0 0	*1,200 0 0	38 3 3	3,210 19 5	—	—	3 5 3	8,005 4 4	10
285 0 0	600 0 0	167 12 3	466 6 4	—	- 19 8	45 7 6	3,007 12 2	11
850 0 0	*1,600 0 0	424 13 0	702 15 7	—	—	3 13 5	4,110 18 1	12
300 0 0	*1,150 0 0	506 19 11	154 10 3	2,900 0 0	- 9 2	—	6,150 7 9	13
215 19 6	400 0 0	—	90 17 4	—	—	8 11 3	1,525 14 0	14
1,600 0 0	*1,600 0 0	53 2 6	4,133 0 11	—	—	14 6 6	13,444 7 1	15
880 0 0	*1,200 0 0	24 6 9	3,775 6 2	—	—	—	10,465 2 1	16
600 0 0	650 0 0	99 15 6	1,636 17 2	—	—	—	3,897 7 8	17
400 0 0	—	300 0 0	1,045 18 9	—	—	—	5,558 3 11	18
100 0 0	400 0 0	100 5 6	315 7 5	—	—	8 14 6	1,564 8 11	19
650 0 0	*1,500 0 0	643 5 8	337 1 8	—	—	—	4,485 16 8	20
646 16 11	850 0 0	503 14 3	707 17 1	—	33 7 7	1 0 0	5,105 9 7	21
583 0 0	400 0 0	12 8 0	90 17 4	—	—	5 13 9	1,620 8 11	22
219 17 3	700 0 0	235 10 7	1,094 15 1	—	15 15 0	77 6 0	6,371 12 10	23
325 3 10	800 0 0	107 1 10	53 8 11	—	- 9 3	—	1,930 16 6	24
200 0 0	*1,100 0 0	227 9 1	451 5 0	—	—	94 17 0	2,471 14 7	25
360 0 0	*1,600 0 0	676 4 3	535 6 2	—	4 5 1	186 0 0	4,701 17 0	26
100 0 0	400 0 0	130 2 11	417 9 0	—	3 18 8	—	1,727 8 1	27
1,100 0 0	750 0 0	433 18 7	1,493 11 10	—	55 3 7	—	6,654 2 8	28
467 9 2	*950 0 0	146 7 2	476 5 8	—	6 19 9	149 14 7	2,479 0 5	29
279 0 0	*1,600 0 0	1,068 17 3	1,514 10 11	—	—	79 13 9	7,662 18 11	30
750 0 0	850 0 0	614 15 5	456 1 0	—	9 10 2	309 0 0	6,983 7 1	31
215 0 0	400 0 0	65 7 6	†180 0 0	—	6 16 5	—	2,273 15 2	32
16,283 15 11	26,800 0 0	9,097 4 11	30,708 11 9	12,200 0 0	145 12 6	1,755 5 2	160,273 0 9	

* These sums represent grants in respect of two years. † This sum represents contributions from six parishes.

No.	NAME OF SCHOOL. (*Under the Management of Authorities other than School Boards.*)	INC			
		Balance (if in hand).	Contributions payable from Common Good of Burgh or other Funds administered by Town Council.	Endowments.	School Fees and Books Sold.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
33	Aberdeen, Robert Gordon's College	—	—	27 9 11	4,191 2 5
34	Anstruther, Waid Academy	202 13 11	—	353 4 0	309 6 0
35	Beith, Spier's School	86 6 9	—	1,040 16 4	382 0 0
36	Crieff, Morrison's Academy	*430 13 6	—	1,117 6 0	1,292 17 6
37	Cupar, Bell Baxter School	265 11 5	—	505 17 7	578 3 4
38	Dollar Institution	559 7 6	—	1,317 11 4	2,039 9 11
39	Dundee High School	—	450 0 0	1,205 12 11	3,494 19 7
40	Edinburgh, Daniel Stewart's College	—	—	3,939 14 11	2,837 1 0
41	Edinburgh, George Watson's Boys' College	—	—	6,994 2 4	7,898 6 8
42	Edinburgh, George Watson's Ladies' College	—	—	4,089 19 9	6,751 0 10
43	Edinburgh, Ladies' College	—	—	4,241 17 2	7,645 10 9
44	Glasgow, Allan Glen's School	588 14 8	—	1,100 0 0	2,325 13 0
45	Glasgow, Hutchesons' Boys' Grammar School	—	—	3,631 11 0	494 9 0
46	Glasgow, Hutchesons' Girls' Grammar School	3,964 7 10	—	3,631 11 0	1,047 19 6
47	Glasgow, St. Aloysius College	—	—	—	884 15 4
48	Inverness Royal Academy	—	—	1,797 9 6	1,062 5 10
49	Nairn, Rose's Academical Institution	40 4 3	—	78 2 4	154 0 10
50	Newton Stewart, Douglas and Ewart High Schools.	125 18 9	—	460 16 5	382 0 0
51	Perth, Sharp's Institution	—	22 0 0	495 19 7	382 10 10
52	St. Andrew's Madras College	—	—	916 6 4	975 5 2
53	Selkirk High School	†260 13 0	—	200 13 4	72 5 10
54	Stonehaven, Mackie Academy	895 15 4	—	279 0 11	576 10 9
55	Tain Royal Academy	868 11 1	25 0 0	331 3 7	332 1 6
	Total	8,288 18 0	497 0 0	37,756 6 3	46,109 15 7
	Brought forward from previous page	15,694 4 1	4,218 6 1	2,714 6 1	40,655 14 3
	GRAND TOTAL	23,983 2 1	4,715 6 1	40,470 12 4	86,765 9 10

* This includes £400 from Building Fund Account. † This includes £31 5*s.* 11*d.* from Building Fund Account.

OME.

Grants from Committees of Burghs and Counties for Secondary Education under § 2 (1) (b) of Education and Local Taxation Account (Scotland) Act, 1892.	Grants from Scotch Education Department under Minute of 27th April, 1899.	Grants from Scotch Education Department for Science and Art.	Payments out of the School Fund.	Loan raised for Enlargement of School.	Interest on Bank Deposits.	Other Sources of Income.	Total Income.	No.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
500 0 0	750 0 0	2,150 0 0	—	—	—	—	7,618 12 4	33
260 0 0	400 0 0	220 1 9	—	—	8 9 4	—	1,753 15 0	34
120 0 0	400 0 0	—	—	—	—	—	2,029 3 1	35
274 0 0	600 0 0	—	—	—	—	—	3,614 17 0	36
313 15 0	400 0 0	104 9 4	—	—	11 8 9	4 3 8	2,183 9 1	37
140 0 0	700 0 0	396 13 4	—	—	16 0 9	111 7 9	5,280 10 7	38
1,050 0 0	750 0 0	496 4 5	—	—	27 7 2	117 0 4	7,591 4 5	39
200 0 0	600 0 0	—	—	—	—	—	7,576 15 11	40
200 0 0	750 0 0	251 17 8	—	—	—	—	16,094 6 8	41
350 0 0	750 0 0	132 11 3	—	—	—	—	12,073 11 10	42
650 0 0	750 0 0	143 8 4	—	—	—	—	13,430 16 3	43
600 0 0	850 0 0	2,860 10 7	—	—	—	53 0 0	8,377 18 3	44
300 0 0	550 0 0	—	—	—	43 11 2	—	5,019 11 2	45
300 0 0	650 0 0	—	—	—	43 11 2	—	9,637 9 6	46
329 2 6	450 0 0	178 6 1	—	—	—	337 9 1	2,179 13 0	47
200 0 0	500 0 0	—	—	—	—	—	3,559 15 4	48
200 0 0	400 0 0	33 14 4	—	—	—	80 16 10	986 18 7	49
270 0 0	450 0 0	208 0 2	—	—	—	—	1,896 15 4	50
141 0 0	450 0 0	766 [illegible] 1	—	—	—	—	2,257 11 6	51
260 0 0	450 0 0	142 3 0	—	—	—	—	2,743 14 6	52
108 18 0	400 0 0	89 4 6	—	—	—	20 17 3	1,152 11 11	53
360 0 0	400 0 0	210 15 10	—	—	35 7 7	36 19 11	2,794 10 4	54
115 0 0	400 0 0	183 16 3	—	—	—	—	2,255 12 5	55
7,241 15 6	12,700 0 0	8,567 17 11	—	—	185 15 11	761 14 10	122,109 4 0	
16,283 15 11	26,800 0 0	9,097 4 11	30,708 11 9	12,200 0 0	145 12 6	1,755 5 2	160,273 0 9	
23,525 11 5	39,500 0 0	17,665 2 10	30,708 11 9	12,200 0 0	331 8 5	2,517 0 0	282,382 4 9	

TABLE I.

No.	NAME OF SCHOOL. (*Under the Management of School Boards.*)	EXPEND						
		Balance (if overdrawn).	Salaries of Teachers.	Enlargement of School Buildings.	Books, Apparatus, and Stationery.	Fuel, Light, and Cleaning.	Replacement of Furniture, and Repairs to Buildings and Furniture.	Interest on Loans.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Aberdeen, Girls' High School	—	4,547 10 1	—	98 12 9	476 18 5	136 9 8	715 3 0
2	Aberdeen Grammar School	—	5,144 14 3	758 13 0	193 16 7	356 8 0	374 3 3	475 16 0
3	Arbroath High School	—	1,924 5 0	—	65 17 3	83 18 11	161 4 6	307 7 6
4	Ayr Academy	73 11 11	3,357 13 0	1,538 3 0	100 18 6	135 3 6	149 10 7	132 8 0
5	Brechin High School	—	1,428 19 2	—	111 1 5	51 3 1	148 2 0	95 18 2
6	Callander, McLaren High School.	—	863 16 6	920 3 1	71 9 10	57 12 8	26 13 11	60 10 1
7	Dumfries Academy	—	3,543 14 8	—	83 16 10	165 6 8	112 7 11	447 7 6
8	Dunfermline High School	—	2,663 12 11	—	109 8 7	410 11 2	132 18 7	—
9	Duns, Berwickshire High School.	—	1,087 4 7	—	121 19 10	72 7 5	22 2 10	—
10	Edinburgh Royal High School.	—	5,955 3 6	—	108 12 4	285 6 9	206 3 7	220 9 4
11	Elgin Academy	—	1,471 2 2	—	61 18 11	121 12 5	43 19 0	139 4 3
12	Falkirk High School	222 6 10	2,065 0 0	—	90 15 0	133 12 3	73 12 1	403 17 7
13	Forfar Academy	—	1,562 12 2	683 11 6	148 16 4	74 3 6	– 15 3	43 15 0
14	Galashiels Academy	—	707 7 6	—	36 2 9	34 4 0	18 19 9	4 11 7
15	Glasgow High School	—	9,222 3 1	—	138 7 7	359 5 4	757 12 3	1,081 1 0
16	Glasgow High School for Girls.	—	6,384 1 6	—	118 0 8	373 17 3	1,666 11 6	756 16 0
17	Govan, Hillhead School	—	3,179 11 5	—	111 12 3	84 3 0	25 0 0	143 0 0
18	Greenock Academy	—	3,598 13 0	—	141 0 5	167 19 6	122 8 9	194 7 0
19	Haddington, Knox Institute	—	1,005 8 4	—	78 15 0	90 19 5	32 8 10	66 8 3
20	Hamilton Academy	—	3,334 18 4	283 17 0	108 9 7	357 10 10	131 6 7	16 9 2
21	Irvine Royal Academy	—	2,009 18 10	—	74 10 9	148 1 10	297 6 7	447 18 11
22	Kelso High School	—	1,280 19 10	—	40 19 4	92 4 0	34 3 1	36 11 4
23	Kirkcaldy High School	—	1,917 8 10	2,255 19 11	266 9 5	214 7 3	361 11 7	—
24	Kirkcudbright Academy	—	1,262 4 1	—	32 14 7	34 5 9	20 7 5	49 15 9
25	Linlithgow Academy	21 0 0	1,270 6 6	—	126 6 1	131 3 5	28 12 8	243 8 9
26	Montrose Academy	—	2,469 3 10	—	342 17 6	170 6 0	58 15 5	212 17 5
27	North Berwick High School	—	843 11 1	—	29 5 7	52 11 7	17 1 10	115 15 3
28	Paisley Grammar School	—	3,651 3 10	—	39 14 1	370 9 2	54 14 9	460 0 2
29	Peebles High School	—	1,168 14 0	287 0 0	44 15 10	158 16 4	15 13 11	149 14 5
30	Perth Academy	1,355 5 3	4,579 11 0	—	256 10 10	289 12 6	99 11 7	221 15 8
31	Stirling High School	—	3,316 13 9	446 12 6	170 15 1	245 7 3	183 9 11	83 9 7
32	Stranraer High School	—	1,148 12 8	—	132 13 4	43 16 10	15 1 2	—
	Carried forward	1,672 4 0	87,965 19 5	7,174 0 0	3,657 4 10	5,843 6 0	5,529 0 9	7,325 16 8

—*Continued.*

ITURE.						BALANCE.				
Repayment of Loans.	Rent, Rates, Taxes and Insurance.	Expenses incident to Annual Examination.	Printing, Postages, Advertising, etc.	Other Expenses.	TOTAL EXPENDITURE.	If in hand.	If overdrawn.	Total Assessment in the £ for School Rate.	Product of a Rate of 1*d.* in the £.	No.
£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	*s.* *d.*	£	
512 16 8	174 6 1	1 0 0	35 0 5	47 7 3	6,745 4 4	24 14 10	—	1 5	3,129	1
536 15 6	201 17 5	7 3 10	48 2 9	182 14 4	8,280 4 11	—	409 5 1			2
369 5 5	135 14 2	18 5 6	18 12 11	159 8 10	3,244 0 0	651 8 9	—	1 1 1/16	310	3
247 1 8	105 4 5	33 12 6	47 16 4	279 11 2	6,200 14 7	5,776 12 1	—	1 4 3/8	630	4
93 0 0	30 10 0	7 2 11	5 1 0	54 15 0	2,025 12 9	381 13 10	—	1 2	124	5
64 1 7	47 19 9	—	8 5 1	27 18 3	2,148 10 9	1,132 13 7	—	8	80	6
356 0 0	86 8 6	8 15 4	37 2 0	62 18 2	4,903 17 7	—	55 2 10	1 4 23/24	240	7
—	80 19 6	4 18 0	30 2 8	161 19 2	3,594 10 7	1,187 17 0	—	1 3	307	8
—	25 0 11	- 10 0	30 1 9	349 3 4	1,708 10 8	533 8 0	—	9 3/16	86	9
393 12 6	319 6 6	1 14 0	105 15 11	408 19 11	8,005 4 4	—	—	1 0 3/16	10,050	10
168 2 4	89 13 6	—	15 16 9	64 16 10	2,176 6 2	831 6 0	—	1 3	139	11
298 18 0	97 5 10	- 10 0	9 19 3	22 14 3	3,418 11 1	692 7 0	—	2 0	400	12
110 0 0	14 3 11	3 13 5	13 13 0	37 4 3	2,692 8 4	3,457 19 5	—	11	137	13
17 15 4	17 19 1	—	12 18 1	3 9 3	853 7 4	672 6 8	—	1 7	210	14
1,130 0 0	608 5 3	8 8 10	109 7 0	29 16 9	13,444 7 1	—	—	1 4	14,030	15
760 0 0	287 1 11	8 10 4	80 2 11	30 0 0	10,465 2 1	—	—			16
212 0 0	138 17 0	3 4 0	—	—	3,897 7 8	—	—	1 2½	4,745	17
200 16 3	151 4 3	—	56 5 1	208 10 6	4,841 4 9	716 19 2	—	1 0½	1,360	18
61 3 3	52 3 7	—	22 9 10	56 19 5	1,466 15 11	97 13 0	—	1 7	65	19
33 6 8	92 14 3	3 9 0	48 11 4	67 5 2	4,477 17 11	7 18 9	—	2 1	327	20
257 15 10	55 18 1	9 5 0	23 19 2	135 19 5	3,460 14 5	1,644 15 2	—	1 2	118	21
54 6 0	39 9 9	—	16 16 2	65 4 6	1,660 14 0	—	40 5 1	9½	101	22
—	148 4 4	—	24 0 11	158 15 1	5,346 17 4	1,024 15 6	—	1 4¾	376	23
64 0 0	10 7 6	—	3 7 0	33 13 0	1,510 15 1	420 1 5	—	8¼	80	24
472 16 3	62 12 9	—	21 19 8	35 4 5	2,413 10 6	58 4 1	—	1 4	126	25
263 13 4	80 1 9	—	50 4 10	127 19 1	3,775 19 2	925 17 10	—	1 6 5/16	180	26
144 10 0	26 15 5	—	4 16 6	31 1 8	1,265 8 11	461 19 2	—	10½	147	27
354 7 0	191 8 9	18 6 2	22 11 9	27 16 8	5,190 12 4	1,463 10 4	—	1 2½	1,279	28
120 15 2	36 5 6	—	7 17 0	7 4 1	1,996 16 3	482 4 2	—	7 27/48	135	29
416 0 0	158 16 3	11 11 6	61 6 4	524 13 10	7,974 14 9	—	311 15 10	1 2	739	30
147 13 3	78 9 2	3 4 10	26 10 0	168 1 1	4,870 6 5	2,113 0 8	—	1 0¼	407	31
—	38 17 10	—	17 17 6	23 3 0	1,420 2 4	853 12 10	—	10	103	32
7,860 12 0	3,684 2 11	153 5 2	1,016 10 11	3,594 7 8	135,476 10 4	25,612 19 3	816 8 10	—	—	

EXPEND

No.	NAME OF SCHOOL. (*Under the Management of Authorities other than School Boards.*)	Balance (if overdrawn).	Salaries of Teachers.	Enlargement of School Buildings.	Books, Apparatus, and Stationery.	Fuel, Light, and Cleaning.	Replacement of Furniture, and Repairs to Buildings and Furniture.	Interest on Loans.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
33	Aberdeen, Robert Gordon's College.	—	6,148 4 2	88 4 11	186 6 4	323 11 0	255 9 11	172 0 6
34	Anstruther, Waid Academy -	—	996 1 0	—	39 8 1	33 14 9	150 13 3	—
35	Beith, Spier's School - -	—	1,240 15 0	—	46 13 6	47 18 3	105 8 5	—
36	Crieff, Morrison's Academy -	—	2,300 2 8	—	115 18 7	39 15 10	154 13 9	—
37	Cupar, Bell Baxter School -	—	1,475 0 0	—	45 4 7	83 7 7	48 9 6	—
38	Dollar Institution - -	—	3,291 5 5	—	157 5 6	72 12 5	115 18 6	—
39	Dundee High School - -	3,082 9 0	5,596 8 1	—	107 4 8	290 16 1	500 14 3	156 8 5
40	Edinburgh, Daniel Stewart's College.	—	4,118 19 6	—	60 11 0	217 2 1	940 2 9	—
41	Edinburgh, George Watson's Boys' College.	—	10,480 19 9	321 8 0	171 12 2	324 14 1	340 19 7	—
42	Edinburgh, George Watson's Ladies' College.	—	7,326 8 6	224 3 2	157 1 0	335 10 2	166 9 4	—
43	Edinburgh Ladies' College -	—	8,127 9 0	113 1 5	126 18 5	453 16 1	234 4 0	—
44	Glasgow, Allan Glen's School	—	4,675 17 8	—	903 9 11	350 0 5	416 8 6	202 4 11
45	Glasgow, Hutchesons' Boys' Grammar School.	566 19 6	2,841 10 0	—	341 14 7	165 19 8	226 1 3	—
46	Glasgow, Hutchesons' Girls' Grammar School.	—	3,308 18 4	—	521 14 3	153 19 7	241 2 0	—
47	Glasgow, St. Aloysius College	—	1,455 16 8	—	185 5 8	112 15 0	103 11 10	36 0 0
48	Inverness, Royal Academy -	1,438 16 3	2,049 7 0	—	54 4 1	89 11 5	17 15 9	3 13 9
49	Nairn, Rose's Academical Institution.	—	750 16 3	—	8 9 8	45 0 6	29 5 6	—
50	Newton Stewart, Douglas and Ewart High Schools.	—	1,533 2 8	—	68 15 2	82 0 2	97 11 8	—
51	Perth, Sharp's Institution -	274 14 11	1,981 15 8	—	75 8 2	140 1 10	57 19 7	—
52	St. Andrews, Madras College -	432 3 9	1,979 3 0	—	35 1 3	60 9 2	50 5 0	—
53	Selkirk High School - -	—	567 12 0	—	47 8 10	53 10 0	5 16 7	50 11 10
54	Stonehaven, Mackie Academy	—	1,296 15 0	165 0 0	55 2 5	59 13 10	24 13 5	—
55	Tain Royal Academy - -	—	1,085 0 0	—	49 8 6	52 10 3	24 15 8	—
	Total - -	5,795 3 5	74,627 7 4	911 17 6	3,560 6 4	3,588 10 2	4,308 10 0	620 19 5
	Brought forward from previous page -	1,672 4 0	87,965 19 5	7,174 0 0	3,657 4 10	5,843 6 0	5,529 0 9	7,325 16 8
	GRAND TOTAL - -	7,467 7 5	162,593 6 9	8,085 17 6	7 217 11 2	9,431 16 2	9,837 10 9	7,946 16 1

ITURE.

Repayment of Loan.	Rent, Rates, Taxes, and Insurance.	Expenses incident to Annual Examination.	Printing, Postages, Advertising, etc.	Other Expenses.	TOTAL EXPENDITURE.	BALANCE. If in hand.	BALANCE. If overdrawn.	No.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
—	117 13 6	13 6 0	57 15 10	653 2 2	8,015 14 4	—	397 2 0	33
—	85 7 6	—	16 9 2	126 13 4	1,448 7 1	305 7 11	—	34
—	8 7 6	—	38 9 11	430 4 1	1,917 16 8	111 6 5	—	35
—	144 4 4	2 18 0	—	296 12 9	3,054 5 11	*560 11 1	—	36
—	37 1 5	—	17 18 10	113 8 7	1,820 10 6	362 18 7	—	37
—	152 3 2	—	66 9 9	429 17 2	4,285 11 11	994 18 8	—	38
—	191 9 2	3 2 10	118 12 1	462 2 6	10,509 7 1	—	2,918 2 8	39
—	794 10 0	—	210 19 10	1,234 10 9	7,576 15 11	—	—	40
—	1,855 16 8	8 6 0	209 7 4	2,381 3 1	16,094 6 8	—	—	41
—	1,573 18 7	8 18 10	151 12 10	2,129 9 5	12,073 11 10	—	—	42
—	1,392 14 1	11 14 8	192 0 7	2,778 18 0	13,430 16 3	—	—	43
266 13 4	61 4 5	23 9 2	127 10 7	719 14 1	7,746 13 0	631 5 3	—	44
—	133 3 5	19 0 0	54 10 4	1,008 16 8	5,357 15 5	—	338 4 3	45
—	284 14 2	21 18 6	56 15 1	825 4 4	5,414 6 3	4,223 3 3	—	46
—	150 10 0	2 0 0	7 17 0	125 16 10	2,179 13 0	—	—	47
—	186 5 6	8 2 9	36 1 6	‡419 7 2	4,303 5 2	—	743 9 10	48
—	69 9 0	—	11 16 7	41 0 4	955 17 10	31 0 9	—	49
—	91 6 9	—	30 5 4	113 14 8	2,016 16 5	—	120 1 1	50
—	47 6 5	19 18 8	52 13 9	136 3 4	2,786 2 4	—	528 10 10	51
—	83 8 9	4 0 6	24 5 6	336 2 3	3,004 19 2	—	261 4 8	52
53 6 8	9 14 4	—	2 17 6	35 8 8	826 6 5	†326 5 6	—	53
154 12 7	46 13 5	—	5 14 0	§312 5 6	2,120 10 2	674 0 2	—	54
—	15 14 10	—	6 8 0	95 16 9	1,329 14 0	925 18 5	—	55
474 12 7	7,532 16 11	146 15 11	1,496 11 4	15,205 12 5	118,269 3 4	9,146 16 0	5,306 15 4	
7,860 12 0	3,684 2 11	153 5 2	1,016 10 11	3,594 7 8	135,476 10 4	25,612 19 3	816 8 10	
8,335 4 7	11,216 19 10	300 1 1	2,513 2 3	18,800 0 1	253,745 13 8	34,759 15 3	6,123 4 2	

* This includes £500 from Building Fund Account. † This includes £52 3*s.* 2*d.* from Building Fund Account.
‡ This includes £100 transferred to Investment Account in terms of Section 41 of the Scheme.
§ This includes £200 placed to School Buildings Depreciation Account.

TABLE II.—SECONDARY SCHOOLS.

Particulars of the Grants paid (or promised) under paragraph 3 of the Minute of 27th April, 1899, in respect of the year 1907–1908.

Schools arranged under Counties.

	£
ABERDEEN—	
Aberdeen, Girls' High School	850
,, Grammar School	850
,, Robert Gordon's College	850
AYR—	
Ayr Academy	700
Beith, Spier's School	400
Irvine Royal Academy	850
BERWICK—	
Duns, Berwickshire High School	400
CLACKMANNAN—	
Dollar Institution	750
DUMFRIES—	
Dumfries Academy	850
EDINBURGH—	
Edinburgh, Dan. Stewart's College	550
,, Geo. Watson's Boys' College	850
,, Geo. Watson's Ladies' College	850
,, Ladies' College	850
,, Royal High School	600
ELGIN—	
Elgin Academy	650
FIFE—	
Anstruther, Waid Academy	400
Cupar, Bell Baxter School	400
Dunfermline High School	800
Kirkcaldy High School	700
St. Andrew's, Madras College	450
FORFAR—	
Arbroath High School	850
Brechin High School	550
Dundee High School	800
Forfar Academy	650
Montrose Academy	850
HADDINGTON	
Haddington, Knox Institute	400
North Berwick High School	400
INVERNESS—	
Inverness Royal Academy	500
KINCARDINE—	
Stonehaven, Mackie Academy	400
KIRKCUDBRIGHT—	
Kirkcudbright Academy	400
LANARK—	
Glasgow, Allan Glen's School	850
,, High School	850
,, High School for Girls	600
,, Hutchesons' Boys' Grammar School	650
,, Hutchesons' Girls' Grammar School	650
,, St. Aloysius' College	500
Govan Hillhead School	700
Hamilton Academy	750

SECONDARY SCHOOLS—*continued.*

	£
LINLITHGOW—	
Linlithgow Academy	550
NAIRN—	
Nairn, Rose's Academical Institution	400
PEEBLES—	
Peebles Burgh and County High School	500
PERTH—	
Callander, McLaren High School	400
Crieff, Morrison's Academy	450
Perth Academy	850
Perth, Sharp's Institution	450
RENFREW—	
†Greenock Academy	600
Paisley Grammar School and Wm. B. Barbour Academy	750
ROSS—	
Tain Royal Academy	400
ROXBURGH—	
Kelso High School	400
SELKIRK—	
Galashiels Academy	400
Selkirk High School	400
STIRLING—	
Falkirk High School	750
Stirling High School	850
WIGTOWN—	
Newtown Stewart, Ewart and Douglas High Schools	500
Stranraer High School	‡350
TOTAL	33,950

† Since the issue of the last report a grant of £650 has also been paid to this School in respect of the year 1906–1907.

‡ This is an instalment of the amount claimable.

In addition to the above-named Secondary Schools, the following Schools, not in receipt of Grants, have been inspected by the Department during the Session 1907–1908. An asterisk against the name of a School signifies that that School did not present candidates at the Leaving Certificate Examination.

Aberdeen, Queen's Gate School.
Ayr, Newnham House School.
Blairs College.
*Broughty Ferry, Gartlands School.
Broughty Ferry, St. Margaret's School.
Dumfries, Benedictine Convent School.
Dundee, Constitution Road School.
Dundee, Seymour Lodge Girls' School.
Edinburgh Academy.
Edinburgh, Fettes College.
Edinburgh, George Heriot's Hospital School.
*Edinburgh, Girls' Home School.
Edinburgh Institution.
Edinburgh, Merchiston Castle School.
*Edinburgh, Rosebery House School.
*Edinburgh, St. Bride's School.
Edinburgh, St. Elizabeth's School.
Edinburgh, St. George's High School for Girls.
Edinburgh, St. Margaret's Ladies' College (Branches at Newington and Morningside).
Edinburgh, The Ministers' Daughters' College.
Falkirk Selma House School.
Glasgow Academy.
*Glasgow, Hanover Terrace School.
Glasgow, Kelvinside Academy.
Glasgow, Kelvinside, Westbourne Gardens School for Girls.
Glasgow Park Girls' School.
Govan, Hillhead, Laurel Bank School for Girls.
*Greenock, Clyde School.
Greenock, Collegiate School.
Greenock High School for Girls.

SECONDARY SCHOOLS—*continued.*

Helensburgh, Larchfield School.
Helensburgh, St. Bride's School.
Inverness College.
*Inverness, St. Margaret's College.
Kilmacolm, St. Columba's School.
*Kirkcaldy Southbank School.
*Loretto School, Musselburgh.
*Melrose, St. Mary's School.
Newport-on-Tay, St. Fillan's House School.
*North Berwick, Dunardarigh School.
*Paisley, Caversbank School.
*Portobello, Brunstane School for Girls.
St. Andrews, Clifton Bank School.
*St. Andrews, St. Katharine's School.
Stirling, St. Hilda's School.
*Turriff Westwood School.

PREPARATORY SCHOOLS.

*Cramond, Cargilfield School.
*Moffat, St. Ninian's School.
*St. Andrews, St. Salvator's School.

TABLE III.

Secondary Schools.

A.—Particulars of Grants for Science and Art Instruction paid under the Minute of 30th May, 1903, in respect of the year 1906–1907.

NAME OF SCHOOL.	Number of Students recognised for Grant.	GRANT FOR A Physical and Natural Science.	B Drawing.	C Practical Geometry and Educational Handiwork.	D Cookery, Laundry-work, Dress-making, or other Forms of Practical Household Economy.	TOTAL AMOUNT PAID.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Aberdeen High School for Girls.	264	221 19 3	81 7 0	—	65 19 4	369 5 7
Aberdeen, Robert Gordon's College.	532	1,608 10 6	208 12 0	417 14 11	—	2,234 17 5
Arbroath High School -	189	211 16 6	96 3 2	42 16 10	49 12 10	400 9 4
Brechin High School -	86	142 17 6	47 10 3	—	—	190 7 9
Crieff Morrison's Academy.	77	14 8 0	32 7 8	—	4 4 0	50 19 8
Cupar, Bell Baxter School.	71	95 9 6	31 14 3	—	—	127 3 9
Dumfries Academy -	99	155 7 3	51 15 4	20 1 10	—	227 4 5
Dumfries, Mount St. Michael's College.	38	54 1 4	12 1 3	24 2 4	—	90 4 11
Dumfries, St. Joseph's College.	62	57 5 9	24 17 9	49 8 6	—	131 12 0
Dunfermline High School.	215	590 1 8	62 5 4	135 9 0	50 16 10	838 12 10
Edinburgh, George Watson's Boys' College.	80	113 4 0	29 5 0	—	—	142 9 0
Edinburgh, George Watson's Ladies' College.	206	108 10 0	63 2 9	—	—	171 12 9
Edinburgh Ladies' College.	351	241 5 9	138 16 9	—	—	380 2 6
Edinburgh, Royal High School.	24	56 5 6	8 10 9	3 5 2	—	68 1 5
Falkirk High School -	246	280 5 6	111 10 9	52 1 6	63 17 4	507 15 1
Forfar Academy - -	234	407 14 6	109 12 7	48 10 0	46 18 0	612 15 1
Glasgow, Allan Glen's School.	525	2,010 4 1	208 2 6	721 11 11	—	2,939 18 6
Glasgow High School -	41	58 3 9	—	—	—	58 3 9
Glasgow High chool for Girls.	46	54 6 6	14 10 9	—	—	68 17 3
Glasgow, Hutchesons' Boys' Grammar School.	86	92 0 6	38 18 8	—	—	130 19 2
Govan, Hillhead School	66	117 3 4	—	—	—	117 3 4
Greenock Academy -	142	200 16 9	60 3 4	—	33 11 4	294 11 5
Haddington, Knox Institute.	49	55 19 6	25 5 3	15 14 10	8 10 0	105 9 7
Hamilton Academy -	269	430 9 9	106 1 5	98 17 11	99 8 2	734 17 3
Inverness Royal Academy.	54	90 3 6	19 0 3	21 14 6	—	130 18 3
Irvine Royal Academy	158	277 5 6	116 7 4	68 1 6	110 8 0	572 2 4
Linlithgow Academy -	153	128 2 9	72 3 3	—	11 12 10	211 18 10
Montrose Academy -	212	385 7 9	110 7 9	145 17 0	36 15 8	678 8 2
Nairn, Rose's Academical Institution.	37	41 7 3	13 2 8	—	—	54 9 11

NAME OF SCHOOL.	Number of Students recognised for Grant.	GRANT FOR A Physical and Natural Science.	B Drawing.	C Practical Geometry and Educational Handwork.	D Cookery, Laundry-work, Dress-making, or other Forms of Practical Household Economy.	TOTAL AMOUNT PAID.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Newton Stewart, Douglas High School (Girls).	26	61 10 6	12 13 9	—	—	74 4 3
Newton Stewart, Ewart High School (Boys).	36	71 8 6	14 18 7	25 1 10	—	111 8 11
North Berwick High School.	75	98 7 0	31 16 10	26 12 8	14 7 8	171 4 2
Paisley Grammar School and Wm. B. Barbour Academy.	190	320 5 6	71 7 0	50 6 8	54 13 2	496 12 4
Peebles Burgh and County High School.	65	128 4 1	33 11 8	22 2 8	7 17 2	191 15 7
Perth Academy - -	357	684 3 3	169 14 6	148 1 0	56 11 0	1,058 9 9
Perth, Sharp Institution.	174	433 7 0	122 19 6	79 10 5	42 18 2	678 15 1
Selkirk High School -	40	80 5 5	12 15 2	—	9 4 0	102 4 7
Stirling High School -	263	346 14 0	188 10 10	4 4 0	74 8 10	613 17 8
Stranraer High School	62	71 1 0	24 12 10	—	—	95 13 10
Tain Royal Academy -	104	109 7 6	39 5 0	43 19 4	9 0 0	201 11 10
Total - -	6,004	10,705 7 2	2,616 1 5	2,265 6 4	850 14 4	16,437 9 3

B.—Particulars of Grants paid under the Regulations for Secondary Schools in respect of the Year 1906–1907.

NAME OF SCHOOL.	INTERMEDIATE. Number of Students.	INTERMEDIATE. Grant.	SECONDARY: Number of Students.	SECONDARY: Grant.	TOTAL GRANT.
		£ s. d.		£ s. d.	£ s. d.
Aberdeen Grammar School - - - - -	186	482 4 5	15	73 1 0	555 5 5
Anstruther, Waid Academy - - - -	85	240 18 7	9	41 5 0	282 3 7
Callander, McLaren High School - - -	82	226 14 10	3	14 2 0	240 16 10
Dollar Institution - - - - - -	192	544 14 10	4	19 3 0	563 17 10
Dundee High School - - - - - -	152	435 4 10	14	60 18 0	*495 12 10
Duns, the Berwickshire High School - -	72	203 3 9	2	9 18 0	213 1 9
Elgin Academy - - - - - -	107	285 1 10	11	47 10 0	332 11 10
Glasgow, Hutcheson's Girls' Grammar School -	108	305 12 10	18	86 0 0	391 12 10
Glasgow, St. Aloysius College - - - -	66	184 5 10	7	34 3 0	218 8 10
Kelso High School - - - - - -	38	103 19 0	—	—	103 19 0
Kirkcaldy High School - - - -	167	431 7 5	22	94 16 0	526 3 5
Kirkcudbright Academy - - - - -	35	96 2 5	4	19 0 0	115 2 5
St. Andrews Madras College - - -	99	282 18 0	7	34 11 0	317 9 0
Stonehaven Mackie Academy - - -	91	229 19 7	12	49 16 0	279 15 7
Totals - - - - - -	1,480	4,052 8 2	128	584 3 0	4,636 1 2

* A sum of 10s., being an overpayment in respect of the year 1905–1906, has been deducted.

TABLE IV.

TABLE

STATEMENT for the year 1906–1907, showing the Number of Pupils of various ages on the Secondary Schools in Scotland claiming Grant

No.	NAME OF SCHOOL. (*Under the Management of School Boards.*)	NUMBER OF PUPILS ON THE SCHOOL ROLL														
		Under 12 Years.			Between 12 and 13.			Between 13 and 14.			Between 14 and 15.			Between 15 and 16.		
		Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.
1	Aberdeen, Girls' High School	21	159	180	—	37	37	—	35	35	—	60	60	—	58	58
2	Aberdeen Grammar School	204	—	204	45	—	45	56	—	56	54	—	54	56	—	56
3	Arbroath High School	6	8	14	25	19	44	27	15	42	36	31	67	15	18	33
4	Ayr Academy	82	49	131	15	15	30	29	22	51	30	31	61	17	21	38
5	Brechin High School	5	3	8	5	4	9	9	12	21	20	10	30	16	13	29
6	Callander, McLaren High School	—	—	—	1	—	1	10	1	11	15	15	30	14	10	24
7	Dumfries Academy	56	39	95	29	15	44	35	34	69	41	36	77	32	27	59
8	Dunfermline High School	1	2	3	12	7	19	34	26	60	45	36	81	33	34	67
9	Duns, Berwickshire High School	—	1	1	1	1	2	15	14	29	13	10	23	9	21	30
10	Edinburgh Royal High School	174	—	174	48	—	48	42	—	42	59	—	59	52	—	52
11	Elgin Academy	32	27	59	11	7	18	17	15	32	21	10	31	16	14	30
12	Falkirk High School	—	—	—	—	1	1	27	20	47	30	21	51	18	33	51
13	Forfar Academy	—	—	—	7	7	14	27	21	48	40	26	66	31	23	54
14	Galashiels Academy	18	7	25	5	3	8	12	3	15	7	9	16	10	4	14
15	Glasgow High School	185	—	185	73	—	73	123	—	123	132	—	132	164	—	164
16	Glasgow High School for Girls	—	202	202	—	63	63	—	91	91	—	147	147	—	141	141
17	Govan, Hillhead School	—	—	—	5	1	6	16	35	51	47	49	96	29	44	73
18	Greenock Academy	136	128	264	24	22	46	29	24	53	31	38	69	17	16	33
19	Haddington, Knox Institute	22	32	54	3	3	6	5	9	14	6	8	14	8	7	15
20	Hamilton Academy	14	16	30	19	15	34	29	15	44	24	28	52	26	27	53
21	Irvine Royal Academy	48	47	95	18	11	29	27	20	47	15	18	33	21	20	41
22	Kelso High School	22	11	33	5	5	10	9	3	12	8	8	16	5	11	16
23	Kirkcaldy High School	—	—	—	1	2	3	12	19	31	30	31	61	22	28	50
24	Kirkcudbright Academy	5	4	9	10	6	16	11	12	23	8	10	18	9	10	19
25	Linlithgow Academy	26	18	44	6	10	16	13	24	37	18	16	34	5	5	10
26	Montrose Academy	9	16	25	16	12	28	25	13	38	26	34	60	36	24	60
27	North Berwick High School	—	—	—	3	4	7	16	13	29	9	10	19	5	2	7
28	Paisley Grammar School	91	69	160	21	22	43	33	24	57	30	20	50	21	29	50
29	Peebles High School	16	16	32	1	3	4	7	5	12	16	9	25	11	6	17
30	Perth Academy	84	61	145	31	21	52	57	30	87	46	54	100	40	29	69
31	Stirling High School	4	4	8	25	20	45	25	31	56	33	45	78	30	35	65
32	Stranraer High School	15	7	22	2	5	7	6	10	16	11	7	18	6	8	14
	Carried forward	1276	926	2202	467	341	808	783	596	1379	901	827	1728	774	718	1492

IV.

the School Roll, the Average Attendance of Pupils, and the Number of Teachers employed in under paragraph 3 of the Minute of 27th April, 1899.

AT THE CLOSE OF THE SCHOOL YEAR.																										
Between 16 and 17.			Between 17 and 18.			Between 18 and 19.			Over 19 Years.			Total Number of Scholars over 12 Years.			Grand Total.			Number of Scholars in actual Average Attendance throughout the Year.				Number of Teachers.			No.
Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Under 12.	Between 12 and 15.	Over 15.	Total.	Teachers whose whole time is spent in the School.	Non-Graduates.	Pupil Teachers.	
—	48	48	—	41	41	—	22	22	—	25	25	—	326	326	21	485	506	155	112	181	448	11	24	6	1
40	—	40	15	—	15	5	—	5	1	—	1	272	—	272	476	—	476	180	146	112	438	16	6	4	2
5	28	33	7	9	16	1	2	3	—	—	—	116	122	238	122	130	252	13	148	90	251	5	7	2	3
17	25	42	12	13	25	4	9	13	—	8	8	124	144	268	206	193	399	109	117	114	340	12	8	4	4
3	14	17	3	9	12	3	6	9	—	6	6	59	74	133	64	77	141	7	56	68	131	4	5	—	5
13	7	20	1	4	5	1	4	5	2	2	4	57	43	100	57	43	100	—	39	51	90	4	1	3	6
19	16	35	7	12	19	2	8	10	—	2	2	165	150	315	221	189	410	86	171	113	370	14	10	—	7
20	23	43	13	21	34	7	14	21	1	6	7	165	167	332	166	169	335	3	156	168	327	11	8	—	8
5	9	14	—	4	4	—	1	1	—	1	1	43	61	104	43	62	105	1	61	46	108	3	2	6	9
30	—	30	12	—	12	1	—	1	—	—	—	244	—	244	418	—	418	160	139	92	391	15	5	4	10
9	17	26	7	16	23	1	5	6	—	3	3	82	87	169	114	114	228	51	74	81	206	5	6	2	11
11	26	37	5	20	25	1	6	7	1	8	9	93	135	228	93	135	228	—	105	116	221	6	5	5	12
16	22	38	3	9	12	—	2	2	—	—	—	124	110	234	124	110	234	—	121	99	220	10	3	3	13
4	4	8	1	7	8	—	1	1	—	—	—	39	31	70	57	38	95	19	36	32	87	4	1	3	14
123	—	123	37	—	37	7	—	7	6	—	6	665	—	665	850	—	850	177	316	331	824	30	13	3	15
—	124	124	—	53	53	—	27	27	—	11	11	—	657	657	—	859	859	178	281	340	799	19	21	9	16
13	16	29	3	16	19	—	9	9	—	1	1	113	171	284	113	171	284	—	161	123	284	8	8	9	17
21	18	39	4	9	13	2	3	5	1	—	1	129	130	259	265	258	523	212	139	90	441	13	12	4	18
3	9	12	3	2	5	—	—	—	—	—	—	28	38	66	50	70	120	43	30	29	102	4	3	1	19
18	23	41	11	12	23	7	12	19	—	9	9	134	141	275	148	157	305	28	128	143	299	11	12	6	20
20	24	44	12	17	29	4	8	12	1	3	4	118	121	239	166	168	334	84	101	121	306	5	6	4	21
6	4	10	—	2	2	—	4	4	—	1	1	33	38	71	55	49	104	31	33	27	91	4	4	6	22
10	14	24	6	8	14	4	4	8	1	3	4	86	109	195	86	109	195	—	95	87	182	5	7	5	23
3	1	4	—	2	2	1	1	2	—	1	1	42	43	85	47	47	94	8	55	27	90	5	1	2	24
9	7	16	3	6	9	1	4	5	—	5	5	55	77	132	81	95	176	38	86	48	172	7	2	4	25
16	13	29	7	12	19	1	7	8	—	9	9	127	124	251	136	140	276	23	123	127	273	11	3	5	26
1	1	2	1	2	3	—	2	2	—	2	2	35	36	71	35	36	71	—	48	18	66	6	—	4	27
23	14	37	11	10	21	5	5	10	—	3	3	144	127	271	235	196	431	124	144	117	385	10	8	9	28
7	3	10	—	3	3	—	2	2	—	1	1	42	32	74	58	48	106	25	37	28	90	6	3	2	29
32	40	72	11	31	42	3	17	20	1	17	18	221	239	460	305	300	605	131	215	199	545	14	14	4	30
22	23	45	9	19	28	3	18	21	3	7	10	150	198	348	154	202	356	6	166	169	341	12	8	4	31
7	7	14	—	8	8	—	4	4	—	1	1	32	50	82	47	57	104	19	38	37	94	6	2	2	32
526	580	1106	204	377	581	64	207	271	18	135	153	3737	3781	7518	5013	4707	9720	1911	3677	3424	9012	296	218	12	

TABLE

No.	NAME OF SCHOOL. (*Under the Management of Authorities other than School Boards.*)	Number of Pupils on the School Roll														
		Under 12 Years.			Between 12 and 13.			Between 13 and 14.			Between 14 and 15.			Between 15 and 16.		
		Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.
33	Aberdeen, Robert Gordon's College	90	—	90	88	—	88	125	—	125	175	—	175	169	—	169
34	Anstruther, Waid Academy	—	—	—	3	—	3	14	6	20	17	8	25	11	12	23
35	Beith, Spier's School	10	9	19	3	5	8	4	9	13	10	8	18	8	9	17
36	Crieff, Morrison's Academy	35	26	61	12	6	18	19	5	24	26	10	36	16	9	25
37	Cupar, Bell Baxter School	20	21	41	4	7	11	7	4	11	11	5	16	13	8	21
38	Dollar Institution	26	18	44	28	19	47	32	18	50	40	17	57	31	27	58
39	Dundee High School	93	41	134	21	17	38	37	18	55	37	24	61	46	22	68
40	Edinburgh, Daniel Stewart's College	214	—	214	80	—	80	60	—	60	63	—	63	67	—	67
41	Edinburgh, George Watson's Boys' College	508	—	508	140	—	140	157	—	157	159	—	159	158	—	158
42	Edinburgh, George Watson's Ladies' College	—	275	275	—	101	101	—	97	97	—	84	84	—	95	95
43	Edinburgh Ladies' College	—	350	350	—	97	97	—	110	110	—	106	106	—	106	106
44	Glasgow, Allan Glen's School	29	—	29	46	—	46	102	—	102	182	—	182	142	—	142
45	Glasgow, Hutchesons' Boys' Grammar School	68	—	68	35	—	35	45	—	45	69	—	69	55	—	55
46	Glasgow, Hutchesons' Girls' Grammar School	—	88	88	—	35	35		56	56	—	67	67	—	55	55
47	Glasgow, St. Aloysius College	70	—	70	32	—	32	32	—	32	36	—	36	46	—	46
48	Inverness Royal Academy	38	52	90	10	4	14	13	7	20	18	10	28	19	18	37
49	Nairn, Rose's Academical Institution	19	21	40	3	4	7	9	4	13	2	2	4	3	15	18
50	Newton Stewart, Ewart and Douglas High Schools.	19	1	20	4	4	8	7	6	13	8	6	14	8	4	12
51	Perth, Sharp's Institution	—	—	—	6	6	12	21	13	34	33	28	61	25	20	45
52	St. Andrews, Madras College	36	43	79	13	11	24	16	13	29	21	17	38	15	11	26
53	Selkirk High School	6	5	11	1	—	1	2	9	11	8	2	10	3	3	6
54	Stonehaven, Mackie Academy	14	9	23	3	5	8	7	11	18	16	11	27	12	18	30
55	Tain Royal Academy	19	14	33	1	7	8	4	9	13	11	13	24	13	12	25
	Total	1314	973	2287	533	328	861	713	395	1108	942	418	1360	860	444	1304
	Brought forward from previous page	1276	926	2202	467	341	808	783	596	1379	901	827	1728	774	718	1492
	GRAND TOTAL	2590	1899	4489	1000	669	1669	1496	991	2487	1843	1245	3088	1634	1162	2796

IV.—*continued.*

AT THE CLOSE OF THE SCHOOL YEAR.

Between 16 and 17.			Between 17 and 18.			Between 18 and 19.			Over 19 Years.			Total Number of Scholars over 12 Years.			Grand Total.			Number of Scholars in actual Average Attendance throughout the Year.				Number of Teachers.			No.
Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Under 12.	Between 12 & 15.	Over 15.	Total.	Teachers whose whole time is spent in the School. Graduates.	Non-Graduates.	Visiting Teachers.	
112	—	112	83	—	83	33	—	33	34	—	34	819	—	819	909	—	909	79	343	371	793	24	5	5	33
1	11	12	1	7	8	—	3	3	—	2	2	47	49	96	47	49	96	—	46	51	97	4	1	2	34
15	9	24	—	4	4	3	2	5	1	—	1	44	46	90	54	55	109	17	36	47	100	5	2	1	35
18	11	29	10	3	13	2	1	3	1	1	2	104	46	150	139	72	211	50	72	74	196	8	8	3	36
3	11	14	—	6	6	1	4	5	1	—	1	40	45	85	60	66	126	36	36	45	117	4	10	—	37
31	14	45	22	18	40	5	4	9	1	1	2	190	118	308	216	136	352	41	150	157	348	8	12	1	38
21	28	49	12	13	25	7	11	18	6	5	11	187	138	325	280	179	459	116	141	148	405	16	16	1	39
26	—	26	10	—	10	3	—	3	—	—	—	309	—	309	523	—	523	217	190	75	482	12	6	6	40
119	—	119	51	—	51	29	—	29	1	—	1	814	—	814	1,322	—	1,322	451	424	334	1,209	27	24	5	41
—	65	65	—	46	46	—	20	20	—	5	5	—	513	513	—	788	788	246	266	212	724	10	48	12	42
—	68	68	—	51	51	—	22	22	—	9	9	—	569	569	—	919	919	305	283	241	829	11	61	12	43
84	—	84	26	—	26	4	—	4	—	—	—	586	—	586	615	—	615	38	340	236	614	16	10	5	44
33	—	33	23	—	23	8	—	8	10	—	10	278	—	278	346	—	346	63	136	118	317	8	6	4	45
—	27	27	—	33	33	—	11	11	—	1	1	—	285	285	—	373	373	70	150	122	342	9	11	11	46
15	—	15	13	—	13	3	—	3	4	—	4	181	—	181	251	—	251	64	97	82	243	3	10	2	47
12	8	20	5	9	14	3	3	6	—	—	—	80	59	139	118	111	229	69	60	73	202	6	7	1	48
4	8	12	3	4	7	1	3	4	—	3	3	25	43	68	44	64	108	35	21	38	94	3	4	3	49
9	8	17	4	3	7	4	7	11	—	3	3	44	41	85	63	42	105	18	34	49	101	4	7	2	50
10	12	22	2	3	5	—	4	4	—	1	1	97	87	184	97	87	184	—	97	66	163	7	6	5	51
12	16	28	4	6	10	—	1	1	—	—	—	81	75	156	117	118	235	69	89	68	226	5	7	5	52
4	5	9	1	3	4	—	1	1	—	3	3	19	26	45	25	31	56	9	19	22	50	3	1	2	53
3	12	15	3	4	7	4	2	6	—	2	2	48	65	113	62	74	136	20	50	62	132	6	1	4	54
8	10	18	3	10	13	3	6	9	—	1	1	43	68	111	62	82	144	30	41	61	132	3	4	2	55
540	323	863	276	223	499	113	105	218	59	37	96	4036	2273	6,309	5,350	3246	8,596	2043	3121	2752	7,916	202	267	94	
526	580	1106	204	377	581	64	207	271	18	135	153	3737	3781	7,518	5,013	4707	9,720	1911	3677	3424	9,012	296	218	125	
1066	903	1969	480	600	1080	177	312	489	77	172	249	7773	6054	13,827	10,363	7953	18,316	3954	6798	6176	16,928	498	485	219	

TABLE V.

I. FUND established under paragraph 6 of the Minute of 27th April 1899.

	£	s.	d.
Payment into Fund for the year 1899–1900	7,659	16	0
,, ,, ,, 1900–1901	9,345	19	0
,, ,, ,, 1901–1902	9,837	15	6
,, ,, ,, 1902–1903	7,438	2	1
,, ,, ,, 1903–1904	4,539	15	8
,, ,, ,, 1904–1905	2,689	11	11
,, ,, ,, 1905–1906	2,051	19	8
,, ,, ,, 1906–1907	*337	19	11
Total - - -	£43,900	19	9

Grants to the amount of 22,277*l.* 0*s.* 10*d.*, particulars of which will be found in the Report for the year 1906, were made from the Fund during the years 1901 to 1906. No subsequent payment out of the Fund has been made.

Balance standing to the credit of the Fund, 21,623*l.* 18*s.* 11*d.*

II. SUM available under paragraph 2 of the Minute of 27th April 1899, as amended by the Minute of 27th February 1908.

Balance available for Agricultural Education as shown on page 52 of last year's Report, 2,252*l.* 7*s.* 10*d.*

Further payments during 1907–1908.	£	s.	d.
Inspection Expenses of the Agricultural Institutions - - - -	68	16	2
Edinburgh and East of Scotland College of Agriculture—Forestry Classes conducted in the University of Edinburgh - -	100	0	0
Edinburgh and East of Scotland College of Agriculture — Grant in aid of capital expenditure - - - -	74	14	2
The West of Scotland Agricultural College —Capital Grant, Holmes Farm, Kilmarnock - - - - -	100	0	0
The West of Scotland Agricultural College— Special Maintenance Grant to Kilmarnock Dairy School - - - -	200	0	0
	£543	10	4

1908–1909. SUM available, 11,708*l.* 17*s.* 6*d.*

* In the Report for the previous year this amount stood at 987*l.* 19*s.* 11*d.*, but since the publication of that Report an outstanding grant of 650*l.* has been paid under paragraph 3 of the Minute.

TABLE VI.

SYNOPSIS of the SCHEMES of BURGH and COUNTY COMMITTEES as approved by the SCOTCH EDUCATION DEPARTMENT, for the distribution of the sums* available under the Minute of 10th June 1897, as amended by the Minute of 30th April 1900, and under the Minute of 9th March 1907, for SECONDARY EDUCATION in their respective districts for the year ended 31st March 1908, and also of any sums entrusted to the COMMITTEES by LOCAL AUTHORITIES for purposes of Technical Education.

ABERDEEN BURGH.

Grant for year ended 31st March 1908:—	£	*s.*	*d.*
Under the Minute of 10th June 1897	1,830	8	4
" " " *9th March* 1907	1,304	6	7

Scheme approved 2nd January 1908.
Allocation of grant:—

I. Fixed Grants, provided that no portion shall be expended in such a way as to be in substitution for or in relief of rates—

	£
I. To the Aberdeen School Board (of which the Grammar School and the Girl's High School shall each receive at least 500*l.*)	1,150
II. To Robert Gordon's College	650

II.—A. Intermediate Bursaries:—

I. Placed at the disposal of the Aberdeen School Board to be awarded as Intermediate Bursaries (entitling the holders to free education, books and apparatus at the Central School) tenable for three years to pupils who have passed the Qualifying Examination and whose parents require aid to assist them in their education	1,000
II. Bursaries of 5*l.* each, subject to the same conditions, to three applicants in attendance at the Queen's Cross Higher Grade Roman Catholic School.	

II.—B. Secondary Bursaries:—

To the School Board of the Burgh of Aberdeen on behalf of the Junior Students in training at the Central School	750

ABERDEEN COUNTY.

Grant for year ended 31st March 1908:—	£	*s.*	*d.*
Under the Minute of 10th June 1897	1,902	17	0
" " " *9th March* 1907	1,362	5	6
Contributions by local authorities	618	17	1

Scheme approved, 2nd January 1907.
Allocation of grant:—

A.—SECONDARY EDUCATION.

I. 100*l.* each to Huntly Gordon, and to Peterhead (Burgh) Academy Higher Grade Public Schools, recognised as Centres of Instruction for Junior Students = 200*l.*

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* In some cases where the Committees have a balance in hand from the previous year, the sums allocated under their Schemes may exceed in amount the grant payable to them in respect of the year ended 31st March 1908.

II. Such proportion, not exceeding two-thirds, of the deficit on the Higher Grade Schools, or schools intending to become Higher Grade, as the funds may admit of. No grant to exceed 150*l.* or fall below 10*l.*

III. To teachers of schools not otherwise aided under this Scheme, on account of the preliminary instruction of pupils who subsequently continue their studies at a Higher Grade or Secondary Department or School = 250*l.*

IV.—(a) Intermediate Bursaries tenable for not more than three years at Higher Grade or approved Intermediate or Secondary Departments, by pupils qualified in terms of Article 29 of the Code.

(b) Secondary Bursaries, tenable for not more than three years at a school approved by the Committee, by pupils who hold the Intermediate Certificate.

Travelling allowances may be added to either class of Bursary, or may be granted without a Bursary; and a maintenance allowance not exceeding 5*l.* per annum may be given where necessary.

B.—Technical Instruction.

I. For the equipment of schools intending to become Higher Grade = 300*l.*

II. For Local Technical, including Itinerant, Classes = 150*l.*

III. Grants to Aberdeen Navigation School and Aberdeen Asylum for the Blind, if funds permit.

ARGYLL COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1908:—			
Under the Minute of 10*th June* 1897 - - -	988	10	10
„ „ „ 9*th March* 1907 - - -	630	16	8
„ „ „ „ „ (2*nd para. of* § *II. B.*)	345	0	0

Scheme approved, 24*th June* 1907.

Allocation of grant:—

1. Expenses of Committee - - - - £60.

2. For division equally between the following schools, subject to a maximum of three-fourths of the deficit in each case:—

Campbeltown (Burgh) Grammar Higher Grade Public School.
Dunoon Grammar Higher Grade Public School.
Oban Higher Grade Public School.
} £600.

3. For division amongst the following schools, in proportion to, but not exceeding three-fourths of, the deficit incurred in giving advanced instruction in secondary subjects, on lines approved by the Department for the Intermediate Certificate Examination, to pupils who have passed the Qualifying Examination (Article 29 of the Code):—

Kilarrow and Kilmeny, Bowmore Higher Grade Public School.
Tobermory Public School.
Lochgilphead Public School.
Tarbert Public School.
Tighnabruaich Public School.
} £200.

4. Grants under Head 3 must be devoted to Secondary Education, and not to relief of rates.

5.—(1) Secondary Bursaries of the minimum value of 5*l.*, which may with approved travelling or maintenance allowance, amount to 20*l.*, open to pupils holding the Intermediate Certificate; tenable for two or three

years at a centre of instruction approved by the Department in the case of Junior Students, and at a Higher Grade or Secondary School approved by the Committee in the case of other scholars.

(**2**) Intermediate Bursaries of the minimum value of 5*l.*, which may, with approved travelling or boarding allowance, amount to a sum not exceeding 15*l.*; tenable in ordinary cases for three years at an approved Higher Grade or Secondary School, and open to pupils qualified in terms of Article 29 of the Code who reside upwards of three miles from an Intermediate School, or are separated from it by an arm of the sea. Travelling allowances may also be paid to pupils, other than bursars, who reside upwards of two miles from an Intermediate School; and in special circumstances a Bursary of 5*l.* may be awarded to pupils beginning the third year of their Intermediate Course.

(**3**) In awarding Bursaries, the claims of Junior Students will receive special consideration, and as far as possible the Bursaries will be equitably distributed over the Schools or School Board areas from which the applicants are drawn.

AYR COUNTY.

	£	*s.*	*d.*
Grant for year ended 31st March 1908:—			
Under the Minute of 10th June 1897	2,906	0	11
,, ,, ,, ,, *9th March* 1907	2,164	16	9
Contributions by local authorities	2,192	13	1

Secondary and Technical schemes approved, 23rd August 1907.

Allocation of grant:—

SECONDARY EDUCATION.

	£
I. Secondary Schools:—	
Ayr Academy	500
Irvine Royal Academy	400
Beith, Spier's School	200
Kilmarnock (Burgh) Academy Higher Grade Public School	500
Ardrossan Academy Higher Grade Public School	300
Girvan (Town) Higher Grade Public School	130

The above grants are conditional upon the provision of one free place for every 7*l.* 10*s.* paid.

	£
II. Intermediate Schools:—	
Old Cummock Higher Grade Public School	130
Maybole, Carrick Academy Higher Grade Public School	130
Dalry Higher Grade Public School	90
Largs Higher Grade Public School	90
III. Bursaries awarded under former Schemes	1,017
IV. Secondary and Intermediate Bursaries, as under	1,450

(**a**) Secondary Bursaries of the normal value of 10*l.*, open to candidates who hold the Intermediate Certificate, and who propose to continue their education at an approved Secondary School. Junior Students have first claim on these Bursaries.

(**b**) Intermediate Bursaries of amounts to be determined in each particular case, to pupils qualified in terms of Article 29 of the Code, who desire to attend an Intermediate or Secondary School. Preference to be given to candidates whose attendance at a central school will involve outlay for travelling or maintenance; other scholars must be over 14. Bursaries will be equitably distributed over the schools from which applications are received.

	£	*s.*	*d.*
V. Expenses of Committee	133	17	8

TECHNICAL INSTRUCTION.

	£
VI.—(**1**) To the West of Scotland Agricultural College :—	
(*a*) Grant to General Funds of College	550
(*b*) Bursaries for farmers attending Special Month's Course	20
(*c*) Bursaries for attendance of not less than one month at the Dairy School	15
(*d*) Bursaries for foresters attending Special Month's Course	10
(**2**) Continuation Classes :—	
(*a*) Grants, under certain conditions, equal to one-half of the sum contributed locally towards Technical Instruction by the Town Council to Burgh School Boards in aid of Schemes of Technical Instruction as outlined in Divisions II. and III. of the Continuation Class Code	870
(*b*) Grant to Parish School Boards or Local Committees in aid of approved Schemes of Technical Instruction	450
(*c*) Towards Salaries of County Lecturers and Assistants	250
(*d*) Apparatus	50
(**3**) Short courses of Lectures and Demonstrations not suitable for registration under the Continuation Class Code	20
(**4**) Railway fares of Students at Technical Classes	350
(**5**) Prizes for promoting original work and design	50
(**6**)—(*a*) Junior Scholarships (Article 79 (a) Continuation Class Code) open to pupils in rural districts, and of amounts dependent on the distance of the student's home from the place of instruction, and on the need for assistance	160
(*b*) Six Senior Scholarships (Article 79 (b) Continuation Class Code)—two vacant each year—of 50*l.* tenable for three years	150
(**7**) Expenses of organisation, etc.	455
(**8**) Grant to Kilmarnock Dairy School, 250*l.*—one-half	125

BANFF COUNTY.*

	£	*s.*	*d.*
Grant for year ended 31st March 1908 :—			
Under the Minute of 10th June 1897	856	5	9
„ „ „ „ *9th March* 1907	525	0	7
Contributions by local authorities	48	8	6

Bursary and Technical Schemes approved 3rd September 1907.

Allocation of grant :—

	£
I. Expenses of Committee	70
II.—(*a*) Grants to the following Higher Grade Public Schools :—	
Aberlour	70
Banff (Burgh) Academy	95
Fordyce Academy	145
Keith	95
Mortlach	70
Rathven, Buckie	85
(*b*) Grants to the following Public Schools :—	
Botriphnie	10
Boyndie	10
Cullen	25
Enzie, Portgordon	10
Fordyce, Portsoy	23
Gamrie, Macduff	30
Glenrinnes	10

* Sections II., III., and IV. not approved.

	£
Inveravon	15
Inveravon, Glenlivet	10
Kirkmichael, Tomintoul	15
Marnoch, Aberchirder	25
Rathven, &c., Portnockie	12
Rothiemay	15

III. The grants under Head II. (*b*) increased to 30*l.* in respect of any school having, within the year ending 30th August 1908, an Intermediate Curriculum approved by the Department.

IV. The grants under Head II. are subject to the condition that they shall in no case exceed two-thirds of the certified deficiency on the higher department.

IX.–XIV. Bursaries for the year ending 30th June 1908 of 8*l.* to Junior Students who have completed the first year; and of 5*l.* to new candidates who qualify as Junior Students, and a further sum of 50*l.* divided equally among them, but no candidate to receive a larger Bursary than 8*l.* Such allowances will be made for travelling and maintenance as Committee think fit. In the event of a student holding any other Bursary, the Bursary under this scheme to be limited to the amount required to make up an aggregate sum of 15*l.* for second and 10*l.* for first year Junior Students.

XV.–XXIII. Intermediate Bursaries for the year ending 30th June 1908 for all Bursars on Committee's list of intending Junior Students for 1906–7 who continue their studies; and further Bursaries of 3*l.* to one candidate from each Parish, and one more where the average attendance of pupils at schools aided by Parliamentary Grants exceeds 600. Such allowances will be made for travelling and maintenance as Committee think fit. In the event of a pupil holding any other Bursary the Bursary under this scheme to be limited to the amount required to make up an aggregate sum of 10*l.*

Technical Education.

Sums contributed by the Burghs of Buckie and Keith (viz., 38*l.* 1*s.* 2*d.* and 10*l.* 7*s.* 4*d.* respectively) to be handed to the managers of Continuation Classes in those Burghs for the promotion of Technical Education.

BERWICK COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1908:—			
Under the Minute of 10*th June* 1897	530	12	6
„ „ „ „ 9*th March* 1907	264	10	0
Contributions by local authorities	551	2	7
Scheme approved 31*st August* 1907.			
Allocation of grant:—			
1. To Duns, Berwickshire High School	750	0	0
2. Travelling expenses and allowances to pupils, to be paid through the managers of the above-named school	270	0	0
3. To Edinburgh and East of Scotland College of Agriculture	50	0	0
4. Expenses of Committee	25	0	0
5. To Bursary Fund	239	5	6

Intermediate Bursaries of 1*l.*, tenable for three years (or until the Intermediate Certificate is obtained), open to pupils of 12, but not more than 13, years of age who have passed the qualifying Examination and are prepared to carry out the curriculum entitling bursar to the award of the Intermediate Certificate at a school approved by the Committee.

Secondary Bursaries of 5*l.*, tenable for three years (or until the Leaving or Junior Student Certificate is obtained), open to pupils holding the Intermediate Certificate prepared to enter on a curriculum leading up to the stage

of the Leaving Certificate at a school approved by the Committee. Certain of these Bursaries are reserved for Junior Students.

The bursaries may be augmented by an allowance, at the discretion of the Committee, for fees, travelling, or maintenance. As far as possible one bursary will be given to each school from which there is a qualified applicant. Additional bursaries will be given according to the number at the disposal of the Committee and the comparative claims of the schools.

BUTE COUNTY.

Grant for year ended 31st March 1908:—	£	s.	d.
Under the Minute of 10th June 1897 - - - -	399	10	11
„ „ „ „ *9th March 1907* - - -	159	12	8

Scheme approved 18th July 1907.

Allocation of grant:—

(**a**) Expenses of Committee - - - - - 24 19 2

(**b**) Five Bursaries of 15*l.*, tenable for two or three years at Rothesay Academy, or other Intermediate or Secondary School approved by the Committee, by scholars from Arran (4) and Cumbrae (2) - - - - - - - - £ 75

NOTE.—Bursars appointed in 1906 will continue to hold these Bursaries until the expiry of the period for which they were granted, but no new Bursars will be appointed.

(**c**) Grant to Rothesay Academy, conditional upon Free Places being given therein to three scholars from each of the Parishes of North Bute and Kingarth - - - - - 300

(**d**)—(**1**) Secondary Bursaries, open to pupils who, having obtained the Intermediate Certificate, propose to continue their education at a Secondary School. These Bursaries are of the value of 6*l.* per annum, with the addition of a maintenance allowance at the Committee's discretion. Junior Students have the first claim on them.

(**2**) Intermediate Bursaries, open to pupils who, having passed the qualifying Examination, have proceeded or are about to proceed to an Intermediate or Secondary School. For scholars not over 14, the value of the Bursary is 2*l.* 10*s.*, and for scholars over 14, 4*l.*; a travelling or maintenance allowance may also be given.

As far as possible, the Bursaries will be equitably distributed over the schools from which applicants are drawn - - 158

CAITHNESS COUNTY.

Grant for year ended 31st March 1908:—	£	s.	d.
Under the Minute of 10th June 1897 - - - -	559	14	11
„ „ „ „ *9th March 1907* - - -	287	16	0
„ „ „ „ „ „ (*2nd para. of § II. B.*) -	159	0	0
Contributions by local authorities - - - -	185	19	3

Scheme approved, 6th September 1907.

Allocation of grant:—

I. Subsidies to the following Higher Grade Public Schools, subject in each case to a maximum of seven-eights of the certified deficiency, and to the condition that candidates must be successfully presented for the Intermediate Certificate:—

	£
Thurso Miller Institution - - -	100
Wick (Burgh) Pulteneytown Academy -	100
Latheron, Lybster - - -	70
Olrig, Castletown - - - -	60
Halkirk - - - - -	60

II.—(1) Intermediate Bursaries:—

	£
(1) Three Bursaries to the Parish of Latheron, two to Halkirk and one each to Olrig, Dunnet, Watten, Reay, and Canisbay of 10*l.* each, tenable for two years at an approved Higher Grade School, to scholars in attendance at public or state-aided schools in the county. Candidates must be qualified in terms of Article 29 of the Code and under 13 years of age. No grant is payable where residence from home is unnecessary, but travelling expenses to an amount not exceeding 5*l.* may be paid where a pupil resides more than three miles from home - - - - - -	100
(2) Bursaries of not more than 10*l.*, tenable, as rule, for one year, at a Higher Grade School approved by the Committee, open to pupils who have completed with credit the second year's course at a Higher Grade School; to be allocated to the schools named under Head I. in proportion to the average attendance of pupils beyond the second year's course, but one Bursary at least will be awarded to each school. Candidates must be over 14 and under 16 years of age - - - - -	120
(3) One Bursary, tenable for three years at Golspie, Sutherland Technical Higher Grade School. Conditions of award similar to those for Parish Bursaries - - - - - - -	30
(4) Supplementing and making of 10*l.* per annum two Bursaries awarded under Bequests by each of the School Boards of Bower and Canisbay - -	14

II.—(2) Secondary Bursaries:—

Bursaries of the maximum value of 15*l.*, tenable for three years at a Higher Grade School approved by the Committee and open to pupils holding the Intermediate Certificate. Preference given to pupils who apply to be nominated as Junior Students - - -	270

III. Grants not exceeding 5*l.* to rural School Boards towards cost of providing permanent apparatus for teaching technical subjects in Continuation Classes.

IV. Expenses of Committee.

CLACKMANNAN COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1908:—			
Under the Minute of 10*th June* 1897 - - - -	538	17	11
„ „ „ „ 9*th March* 1907 - - -	271	2	4
Contributions by local authorities - - - -	13	19	1

Scheme approved on 3rd August 1907.

Allocation of grant:—

I. Fixed Grants as follows:—	£
1. To the School Board of Alloa (Burgh) - - -	230
2. „ „ „ „ Alva - - - -	130

The grant to Alloa (Burgh) School Board is conditional upon provision being made by the Board for the admission to Alloa Academy of pupils from the Parish districts of Alloa and Clackmannan upon the same terms as pupils resident within the Burgh of Alloa.

	£
II. Bursaries - - - - - - - -	338

1.—(**I**) Secondary Bursaries of not more than 6*l.* in the first year or 9*l.* in the second or subsequent years in addition to an allowance for travelling or school fees; open to Junior Students and, so far as funds permit, to other candidates who have obtained the Intermediate Certificate; tenable for two years, but may be continued for a third year. Equitable distribution over schools from which applicants are drawn will be aimed at.

(**II**) Intermediate Bursaries awarded annually to enable pupils to proceed to a school to study for the Intermediate Certificate, varying in amount according to the circumstances of each case and tenable at a Higher School approved by the Committee. Preference given to candidates gaining the Qualifying Certificate between 12 and 13 years of age who intend to proceed to a Higher School or Department at the beginning of the session immediately following its award.

(**2**) To Dollar Institution for the provision of Bursaries at the discretion of the Governors - - - 100

	£	*s.*	*d.*
III. Expenses of Committee - - - -	25	0	3

DUMBARTON COUNTY.

Grant for year ended 31*st March* 1908:—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - -	1,410	3	10
,, ,, ,, ,, 9*th March* 1907 - - -	968	3	1

Scheme approved 28*th June* 1907.

Allocation of grant:—

I. Grants:—

(**1**) To the following Higher Grade Public Schools recognised as centres for the training of Junior Students:—

	£
Row, Helensburgh Hermitage - -	160
Dumbarton (Burgh) Academy - -	160
Old Kilpatrick, Clydebank - -	160

(**2**) To the following Higher Grade Public Schools:—

Bonhill, Vale of Leven Academy - -	120
New Kilpatrick - - -	120
Lenzie Academy - - -	120

II.—(**1**) Intermediate Bursaries of 2*l.* for each of the first two years and 5*l.* for the third year, open to pupils over 12 who have passed the qualifying examination, and are prepared to enrol in an Intermediate or Secondary School. As far as possible, the Bursaries will be equitably distributed over all the schools in the county.

(**2**) Secondary Bursaries of not less than 10*l.* per annum, open to pupils who have obtained the Intermediate Certificate; tenable for three years at an intermediate or Secondary School approved by the Committee, and, in the case of Junior Students (who have first claim on these Bursaries) at a Centre approved by the Department.

Bursars may make a representation with regard to their travelling expenses

DUMFRIES COUNTY.

	£	s.	d.
Grant for year ended 31st March 1908 :—			
Under the Minute of 10th June 1897 - - -	970	16	1
„ „ „ „ *9th March 1907* - - -	616	12	11
Contributions by local authorities - - -	1,105	19	9

Scheme approved 13th March 1908.

Allocation of grant :—

Secondary Education.

1. The "Selected Schools" are :—Dumfries Academy, Annan Academy Higher Grade Public School, Dryfesdale, Lockerbie Academy Higher Grade Public School, Langholm Academy Higher Grade Public School, Moffat Academy Higher Grade Public School, and Closeburn Wallace Hall Academy.

2. To Dumfries Academy :—

(1) The sum of 200*l.*

(2) The sum of 5*l.* for each Secondary Bursar or Junior Student nominated by the Committee attending Dumfries Academy.

3. The sum of 1,050*l.* to be distributed among the "Selected Schools" as follows :—

(1) One-third in proportion to the populations and valuations of the districts assumed to be served by the schools.

(2) One-third in proportion to the average attendance of pupils in the advanced departments who satisfy certain specified conditions.

(3) One-third in proportion to the number of Intermediate Bursars attending the schools.

4. The aggregate of the grants under Heads 2 and 3 not to exceed three times the amount of the contribution from rates in aid of the advanced department. Managers must provide free education for the Bursars and Junior Students nominated by the Committee.

5. Applications for bursaries and maintenance allowances by applicants for nomination as "Junior Students" considered as applications for Secondary Bursaries.

6. Such number of Secondary Bursaries as the Committee may determine, tenable for two years at Dumfries Academy (or in the case of a Junior Student at any recognised Junior Student Centre) and of the value of 5*l.*, to be increased by a contribution towards estimated travelling expenses if student resides over three miles away, and by 13*l.* when residence from home is necessary.

7. Such number of Intermediate Bursaries as the Committee may determine, tenable for three years at any of the "Selected Schools" and of the value of 2*l.*, to be increased by a contribution towards estimated travelling expenses if student resides over three miles from the nearest "Selected School" and by 13*l.* when residence from home is necessary. Candidates must be less than 13 years of age.

Technical Instruction.

8. To the West of Scotland Agricultural College = 150*l.*

9. Two Bursaries of 10*l.* (and such other Bursaries as the Committee may determine), open to candidates over 16, and tenable for three years at the West of Scotland Agricultural College. Bursar must regularly attend full course of classes that will qualify him to go forward for the national diploma in agriculture.

10. Four Bursaries of 2*l.* 10*s.*, tenable for one year at the West of Scotland Agricultural College. Bursars must attend regularly (*a*) one class in the college or (*b*) the special short course of lectures for farmers, &c., and must pay their own class fees.

11. The sum of 50*l.* to be applied in payment of (1) Bursaries not exceeding 5*l.* each or (2) allowances of 2*s.* per day, with class fees and one return railway fare, to students attending for at least six consecutive days' instruction at Kilmarnock Dairy School.

12. A sum in the Committee's discretion towards the maintenance and instruction of blind youths not under 16 years of age at the Royal Blind Asylum, Edinburgh, or other approved institution.

13. 50*l.* for agricultural experiments, instruction in agriculture, bee-keeping, forestry, &c.

14. 125*l.* for expenses of Committee.

17. Building grant on certain conditions to Closeburn, Wallace Hall Academy = (balance of 225*l.*).

DUNDEE BURGH.

Grant for year ended 31st March 1908:—	£	*s.*	*d.*
Under the Minute of 10th June 1897	1,911	17	9
„ „ „ „ *9th March 1907*	1,369	10	2

Scheme approved 4th January 1907.

Allocation of grant:—

	£
I. Expenses of Committee	100
II. To Dundee High School	1,050
„ Dundee Morgan Academy Higher Grade Public School „ „ Harris „ „ „ „ „	950

These grants are conditional upon the provision of certain free places.

III.—(**A**) Intermediate Bursaries, to such number as the funds will allow, open to candidates qualified in terms of Article 29 of the Code, tenable for three years (or until the Intermediate Certificate be obtained), and entitling the holder to free education, &c., at one of the schools under Head II. Maintenance allowances of not more than 5*l.* may be made to the parents of pupils over 14 in specially deserving cases.

(**B**) Secondary Bursaries, to such number as the funds will allow, open to pupils who hold the Intermediate Certificate, tenable for two years (or until the Leaving Certificate, or an equivalent, be obtained), and entitling the holder to free education, &c., at one of the schools under Head I. Further allowances of 10*l.* to girls and 12*l.* to boys may also be made.

IV. Placed at the disposal of the School Board on behalf of Junior Students a sum in proportion to the number under their charge.

EDINBURGH CITY.

Grant for year ended 31st March 1908:—	£	*s.*	*d.*
Under the Minute of 10th June 1897	3,568	10	5
„ „ „ „ *9th March 1907*	2,694	16	5

Scheme approved 9th July 1907.

Allocation of grant:—

	£
I. Fixed Grant to Edinburgh Royal High School	200

II. Grants to six Higher Class Schools conditional upon the establishment of free places:—

School.	*Number of Free Places.*	£	*s.*	*d.*
Edinburgh, Royal High School	30	487	10	0
„ George Watson's Boys' College	18	150	0	0
„ Daniel Stewart's College	18	150	0	0
„ Ladies' College	39	487	10	0
„ George Watson's Ladies' College	21	262	10	0
„ George Heriot's Hospital School	30	150	0	0

These grants are being gradually discontinued by the Bursars being reduced by one-fourth in this and each of the next three years.

III. Grants to the following schools in consideration of the share they are taking in supplying Secondary Education for the Burgh:—

	£
Edinburgh, Royal High School	50
„ George Watson's Boys' College	50
„ Daniel Stewart's College	50
„ George Watson's Ladies' College	50
„ Ladies' College	50
„ Boroughmuir Higher Grade Public School	100
„ Broughton „ „ „ „	100
„ Portobello „ „ „ „	50
„ James Gillespie's Higher Grade School	80
„ Normal and Model United Free Church Higher Grade School	40
„ St. Thomas of Aquins Roman Catholic Higher Grade School	20
„ St. Mary's Cathedral, Albany Street Roman Catholic Higher Grade School	20

IV. Secondary Bursaries (including Bursaries for Junior Students):—

	£	*s.*	*d.*
(a) School Board	2,196	0	0
(b) Open	412	10	0

V. Intermediate Bursaries:—

Bursaries under last year's scheme	220	0	0
Bursaries, under conditions to be adjusted by the Committee, open to pupils who have passed the Qualifying Examination	535	0	0

VI. Balance to be carried forward subject to Expenses of Committee 352 6 10

The sums set aside under sections IV. (b) and V. are only provisionally estimated, and the sums under section III. are subject to modification according to the amounts required for Bursaries.

EDINBURGH COUNTY.

Grant for year ended 31*st March* 1908:—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897	1,192	17	2
„ „ „ „ 9*th March* 1907	794	5	8
Contributions by local authorities	1,303	10	3

Secondary and Technical Scheme approved, 17*th July* 1907.

Allocation of grant:—

Secondary Education.

I.—(1) 90*l.* to each of the following schools, provided that the grant shall in no case exceed three-fourths of the certified deficiency:—

Colinton, Juniper Green Higher Grade Public School.
Dalkeith (Burgh), King's Park Higher Grade Public School.
Lasswade Higher Grade Public School.
Musselburgh Grammar Higher Grade Public School.
Penicuik Higher Grade Public School.
West Calder Higher Grade Public School.

The above grant will be proportionately reduced by 15*l.*, 10*l.*, or 5*l.* where the School Board concerned do not receive into their Higher Grade Department as many as 10, 15 or 20 qualified scholars, whose railway expenses are paid by the Committee.

II.—(**1**) Travelling expenses by railway of scholars, who have passed the Qualifying Examination, to any Higher Grade School selected by the Committee.

(**2**) Twelve Intermediate Bursaries, awarded on the result of a competitive written examination, tenable for three sessions, and open to scholars under 13 qualified in terms of Article 29 of the Code, of 1*l.* up to the age of fourteen, 2*l.* at end of session in which Bursar attains fourteen, 5*l.* at end of second session, and 12*l.* at end of third session; a further sum may be allowed, for travelling expenses - - - - - - - - - £ 200

Bursaries awarded on the principle of assigning one Bursary to each school, or, if that be found impossible, at least one Bursary to each parish; assigned on the same conditions as those which govern Bursaries gained by competition, but of the value of 1*l.* up to the age of fourteen, 2*l.* at the end of the session in which Bursar attains fourteen, 3*l.* at the end of the second session, and 6*l.* at the end of the third session. Scholars may not be nominated from any school by which more than one of the competitive bursaries have been gained.

Four Bursaries tenable for three years, two at the Heriot-Watt College for students in Mining and allied subjects, and two at the East of Scotland College of Agriculture for students in agriculture; open to pupils who have gained the Intermediate Certificate at any Higher Grade School in the county, and of 10*l.*, 20*l.*, and 30*l.*, for the first, second, and third years respectively.

(**3**) Six Secondary Bursaries of 15*l.*, with travelling expenses, tenable until the Leaving or Junior Student's Certificate is gained (but may be continued up to end of third session); open to scholars who hold the Intermediate Certificate and who desire to proceed to a Secondary School or approved Junior Student Centre; awarded to the six candidates who gain the highest marks in the examination for the Intermediate Certificate - - - - - - - 90

Bursaries or allowances of similar amount as the Committee may see fit to Junior Students, together with travelling expenses according to the circumstances of each case.

III. Grants towards the cost of laboratories or other buildings in connection with any new Higher Grade School.

IV. Capitation grants of 10*s.* and 7*s.* 6*d.* to Head Teachers of Elementary Schools for each Scholar qualified in terms of Article 29 of the Code, transferred to, and remaining for one session at, Higher Grade Schools or Higher Departments.

Technical Education.

	£	*s.*	*d.*
I. To Edinburgh and East of Scotland College of Agriculture	400	0	0
,, ,, Heriot-Watt College - - -	150	0	0
,, The Queen Victoria Jubilee Institute for Nurses -	20	0	0
II. For conducting Local Technical Classes in the County, viz., Dressmaking, Cookery and Laundry, Machine Construction and Drawing, Shorthand, Chemistry, Electricity and Magnetism, Mathematics, etc. -	600	0	0
III. Travelling expenses of Scholars from the County to the Heriot-Watt College - - - - -	250	0	0
IV. Expenses of Local Committees - - -	70	0	0
V. General expenses of administration - - -	150	0	0
VI. Apparatus and materials - - - - -	20	0	0

ELGIN COUNTY.

	£	s.	d.
Grant for year ended 31st March 1908 :—			
Under the Minute of 10th June 1897 - - -	672	12	10
„ „ „ *9th March* 1907 - - -	378	2	3
Contributions by local authorities - - - -	215	6	9

Scheme approved 29th August 1907.
Allocation of grant :—

I.—Secondary Education.

1.—(**a**) Grants to the following schools, on condition that free secondary education is given to all bursars under the Committee's Scheme :—

	£
Elgin Academy - - - - - -	285
Bellie, Fochabers, Milne's Institution Higher Grade Public School - - -	50
Forres (Burgh) Higher Grade Public School -	50
Cromdale, Grantown Higher Grade Public School - - - - -	50
Rothes Higher Grade Public School - -	20

(**b**) Grants to Teachers in respect of scholars qualified in terms of Article 29 of the Code who are transferred to a Higher Grade Department, and remain there for a reasonable time.

2.—(**a**) Intermediate Bursaries of 3*l.*, tenable for not more than three years at Secondary or Higher Grade Schools, by pupils who have passed the Qualifying Examination under Article 29 of the Code. Pupils still under the obligation to attend school are not eligible to receive any money payment beyond what may be required to cover expenses actually incurred.

(**b**) Secondary Bursaries of 8*l.*, tenable for not more than three years at a school approved by the Committee, by pupils who have obtained the Intermediate Certificate. Provision will be made for Junior Students under this Head.

An allowance for travelling may be added to either class of bursary, or may be granted without a bursary, and to such bursars as require it a maintenance allowance may be added.

II.—Technical Education.

	£
1. To Elgin Victoria School of Science and Art, conditional upon there being a qualified Science Master on the staff and a scheme, satisfactory to the Department, arranged for the proper co-ordination of the Continuation Class Code work in the district - - - - -	80
To each of the first three Higher Grade Schools under Head 1 (*a*), 20*l.* - - - - -	60

2. Two Bursaries of 20*l.*, tenable at a recognised technical school or college, or at the Aberdeen and North of Scotland College of Agriculture or the Edinburgh and East of Scotland College of Agriculture.

FIFE COUNTY.

	£	s.	d.
Grant for year ended 31st March 1908 :—			
Under the Minute of 10th June 1897 - - -	2,524	7	9
„ „ „ „ *9th March* 1907 - - -	1,859	10	2
Contributions by local authorities - - - -	2,591	7	4

Secondary and Technical Schemes approved, 19th June 1907.
Allocation of grant :—

Secondary Education.

1. Secondary Schools.—Payment of three-fourths (normally) of the deficiency, exclusive of Committee's grant, to the first two schools named

below, and of the whole deficiency to the other three, but not exceeding the following sums:—

	£
Dunfermline High School	140
Kirkcaldy High School	140
Cupar, Bell Baxter School	140
Anstruther, Waid Academy	140
St. Andrews' Madras College	140

II. Intermediate Schools.—Payment of three-fourths (normally) of the deficiency exclusive of the Committee's grant, but not exceeding the following sums:—

	£
Burntisland (Burgh) Higher Grade Public School	90
Ferryport-on-Craig „ „ „ „	90
Forgan, Newport „ „ „ „	90
Newburgh „ „ „ „	90
Scoonie, Leven „ „ „ „	90
Wemyss, Buckhaven „ „ „ „	90

III. Set aside by the Committee to be expended on Bursaries - £2,400.

(**A**) Intermediate Bursaries, of the minimum value of 1*l.* (plus fees, not exceeding 5*l.* a year, to pupils attending a Secondary School) with travelling and maintenance allowances, according to circumstances; open to pupils qualified in terms of Article 29 of the Code, who have proceeded or are about to proceed to an Intermediate or Secondary School; and tenable for three years. As far as possible these bursaries will be equitably distributed over the schools from which applicants are drawn. In the case of pupils under 14 the Bursary will be limited to expenditure actually entailed by attendance at a central school - - Not exceeding 1,200*l.*

(**B**) Secondary Bursaries, of the normal value of 10*l.*, but varying according to circumstances; tenable for three years; open to Junior Students and to pupils other than Junior Students who have obtained the Intermediate Certificate and who propose to continue their education at a Secondary School or Junior Student Centre . . . . Balance of 2,400*l.*

V. Payments to Head-masters, for each duly qualified pupil who has passed into and intends to remain not less than three years at an approved Secondary or Intermediate School. Preferential treatment to be given to teachers of schools unfavourably situated as regards travelling facilities to nearest Secondary or Intermediate School = 100*l.*

VI. Capitation Grants and County Bursaries under previous scheme.

VII. Books to scholars in any Higher Class School for whom such assistance seems desirable, if funds permit.

VIII. Expenses of Committee = 200*l.*

IX. Any unexpended balance to be placed to a Reserve Fund.

TECHNICAL INSTRUCTION.

XI.—(**1**) (*a*) Grants for Science, Drawing, or other approved form of Technical Instruction, of not more than 20*l.* nor more than three-fourths of a certified deficiency, to Higher Grade Schools situated in Burghs contributing the whole of their Residue Grant to the County Committee = 120*l.*

(*b*) Grants to School Boards to assist in providing instruction in such subjects as Health Lectures, Cookery, Laundry, Housewifery, and Physical Culture, in Supplementary Courses = 180*l.*

(**2**) (*a*) Grant to Edinburgh and East of Scotland College of Agriculture = 250*l.*

(*b*) Bursaries to enable young farmers to attend Special Month's Course = 10*l*.
(*c*) Bursaries to enable young women to attend Kilmarnock Dairying Course = 15*l*.
(*d*) Grants for establishing School Gardens, Apparatus, &c., = 10*l*.
(*e*) Grants, Medals, and Certificates for ploughmen = 20*l*.
(*f*) Laying down fruit plot = 20*l*.
(*g*) Local expenses and printing = 25*l*.

(**3**) Lecture Courses (not under the Continuation Class Code) in:—

	£
(*a*) Health Lectures	100
(*b*) Public Health	30
(*c*) Ambulance	50
(*d*) Scientific Lectures	30
(*e*) Expenses, printing, &c.	10

(**4**) Specialised subjects under Divisions II. and III. of the Continuation Class Code:—
(*a*) Central Classes under the County Committee = 1,600*l*.
(*b*) Classes conducted by Burgh School Boards.—Subsidies not exceeding three-fourths of the deficiency, and determined after consideration of the amount contributed by the Local Town Council, and the provision made under Head 4 (*a*) = 800*l*.
(*c*) Classes conducted by Parish School Boards.—Sums equal to three-fourths of the deficiency, but not exceeding 10*l*. for any one school = 300*l*.

(**5**) Teachers' Classes—
(*a*) Bursaries for further Instruction = 50*l*.
(*b*) Travelling expenses = 50*l*.

(**6**) (*a*) Junior Scholarships (Article 79 (*a*) Continuation Class Code) of 10*s*. to 5*l*. each, which may be increased from 1*l*. to 10*l*. by the Department, tenable for one year or longer = 60*l*.
(*b*) Three Senior Scholarships (Article 79 (*b*) Continuation Class Code) of 25*l*. per annum, which may be increased to 50*l*. by the Department, open only to students at classes under the Committee, and tenable for three years = 75*l*.
(*c*) Towards travelling expenses of students attending Central Classes = 30*l*.
(*d*) Prizes for Committee's Central Classes = 15*l*.
(*e*) Printing, &c. = 10*l*.

(**7**) Expenses of Administration = 550*l*.

FORFAR COUNTY.

Grant for year ended 31*st March* 1908:—	£	*s*.	*d*.
Under the Minute of 10*th June* 1897	1,505	9	4
,, ,, ,, ,, 9*th March* 1907	1,044	7	5

Scheme approved 22*nd December* 1906.

Allocation of grant:—	£
I. To Arbroath High School	300
,, Brechin High School	300
,, Forfar Academy	300
,, Montrose Academy	300
II. To Broughty Ferry, Grove Academy Higher Grade Public School	230
,, Kirriemuir, Webster's Seminary Higher Grade Public School	165

The payment of the above grants is conditional upon the provision of Free Scholarships for the Bursars appointed by the Committee.

III.—(**A**) Intermediate Bursaries, entitling the holders to Free Education at an approved Higher Grade or Secondary School, open to pupils qualified in terms of Article 29 of the Code, who are prepared to continue at school for at least three years or until the Intermediate Certificate is obtained. Pupils over 14 whose parents are in necessitous circumstances may also receive a maintenance allowance of not more than 5*l.* a year.

(**B**) Secondary Bursaries, entitling the holders to Free Education at an approved Higher Grade or Secondary School and to an allowance in the Committee's discretion of 12*l.* to girls and 15*l.* to boys; open to pupils in attendance at a Secondary or Higher Grade School who have obtained the Intermediate Certificate; and tenable for not more than three years.

IV. Capitation Grants.—State-aided day schools in the county (except those in Dundee, Arbroath, Brechin, Forfar, Montrose, Broughty Ferry, and Kirriemuir) may receive 1*l.* for each scholar who qualifies in terms of Article 29 of the Code and completes a first year's course in a recognised Higher Grade or Secondary School; but no one school may receive more than 5*l.*

VII. Expenses of Committee = 90*l.*

GLASGOW BURGH.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1908:—			
Under the Minute of 10*th June* 1897 - - -	6,822	1	0
„ „ „ „ 9*th March* 1907 - - - -	5,297	12	10

Scheme approved 9*th August* 1907.

Allocation of grant:—

I. Grants to the following schools, conditional upon the provision of free scholarships for specified numbers of scholars who have previously attended State-aided schools in the school board district of Glasgow:—

	£
Glasgow High School (boys) - - - - - -	1,450
„ „ „ for Girls - - - - -	800
„ Hutchesons' Grammar Schools (boys and girls jointly) - - - - - -	550
„ Allan Glen's School (boys) - - - -	550
„ St. Aloysius' College (boys) - - - -	225
„ St. Mungo's Academy, Higher Grade Roman Catholic School (boys) - - - -	225
„ Our Lady and St. Francis' Higher Grade Roman Catholic School (girls) - - - -	150
„ John Street, Bridgeton Higher Grade Public School - - - - - -	1,700
„ Kent Road Higher Grade Public School - -	
„ Provanside „ „ „ „ - -	
„ Whitehill „ „ „ „ - -	
„ Woodside „ „ „ „ - -	
Continuation Classes for higher instruction under the School Board - - - - - - - -	320
To Glasgow Athenæum Commercial College - - -	150
	6,120

II.—(**A**) Intermediate Bursaries of 4*l.*, open to pupils who have passed the Qualifying Examination. Bursars must immediately after passing Qualifying Examination enter on a course and take the full curriculum for the Intermediate Certificate and present themselves for it. The bursaries are tenable for three years or until the Intermediate Certificate is obtained. Where for reasons satisfactory to the Committee a bursar has not obtained the certificate, the Bursary may be continued for a fourth year.

(**B**) Secondary Bursaries of 15*l.* for boys and 12*l.* for girls, open to pupils who have obtained the Intermediate Certificate, and tenable for three years at an approved Intermediate or Secondary School or Junior Student Centre. Candidates must be either entering on a course as Junior Students or preparing for the Leaving Certificate.

Under Head II. (A) and (B) the amount allocated should be approximately as follows:—

	£	*s.*
School Board of Glasgow (Article 57 of the Regulations for the Preliminary Education, &c., of Teachers)	1,872	10
Open	2,066	0
	3,938	10

III. Balance of 3,497*l.* 6*s.* 10*d.*, with any sum not expended in connection with Junior Students and Secondary or Intermediate Bursaries, carried forward to next year, subject to deduction of Expenses of Committee.

GOVAN PARISH.

Grant for year ended 31st March 1908:—	£	*s.*	*d.*
Under the Minute of 10th June 1897	2,409	16	3
„ „ „ „ *9th March* 1907	1,767	17	0
Contributions by local authorities	400	0	0

Scheme approved 5th July 1907.

Allocation of grant:—	£
A. Expenses of Committee	40

B. Grants to the following schools, on condition that 240 scholarships are provided in the first four, and twelve in the last one, the other two being free schools —

	£
Govan Hillhead School	590
„ Pollokshields, Albert Road Higher Grade Public School	325
„ Bellahouston Academy „ „ „ „	380
„ Partick, Hamilton Crescent „ „ „ „	370
„ Strathbungo Higher Grade Public School	320
„ Fairfield „ „ „ „	320
„ Dowanhill Roman Catholic Practising Higher Grade School	225

C. To Roman Catholic Schools—towards the cost of fees and books for scholars who have already proceeded to the higher departments of certain specified schools — 150

D. To Govan Parish School Board for promotion of Secondary Education under the Continuation Class Code — 120

E. Payments due to second year Bursars — 810

F.—(**1**) To Govan Parish School Board a sum sufficient to provide a limited number of (*a*) Secondary Bursaries, of 10*l.* open to scholars who have obtained the Intermediate Certificate and are continuing their education at a recognised central school, and (*b*) Intermediate Bursaries of the minimum value of 5*l.* open to scholars who, having passed the qualifying examination, are preparing for the award of the Intermediate Certificate. Junior Students have first claim on the Secondary Bursaries.

(**2**) Committee to provide similar bursaries for a limited number of scholars from Voluntary Schools in the parish.

HADDINGTON COUNTY.

	£	s.	d.
Grant for year ended 31st March 1908:—			
Under the Minute of 10th June 1897 - - - -	610	13	6
„ „ „ „ *9th March 1907* - - -	328	10	10
Contributions by local authorities - - - -	67	5	11

Scheme approved 6th July 1907.

Allocation of grant:—

A.—SECONDARY EDUCATION.

	£
1.—(a) To Haddington Knox Institute - - - - -	100
„ North Berwick High School - - - -	100
(b) „ Dunbar (Burgh) Higher Grade Public School - -	80
2. Secondary Bursaries, of amounts dependent on expenditure incurred on travelling, maintenance, books or fees, open to pupils holding the Intermediate Certificate, and tenable for not more than three years or until the Leaving Certificate or Junior Student Certificate is obtained - - - -	242
3. Intermediate Bursaries of amounts calculated on the same principles as the Secondary Bursaries, tenable by pupils qualified in terms of Article 29 of the Code who intend to study for the Intermediate Certificate, at any school with a curriculum approved for that purpose - - -	300
Expenses of Committee - - - - - -	30

B.—TECHNICAL EDUCATION.

To North Berwick High School for physical laboratory apparatus and teachers' salaries, the sums to be received during the current year, and also the sum voted last year and interest.

INVERNESS COUNTY.

	£	s.	d.
Grant for year ended 31st March 1908:—			
Under the Minute of 10th June 1897 - - -	1,156	14	5
„ „ „ „ *9th March 1907* - - -	765	7	7
„ „ „ „ „ „ „ *(2nd para. of § II. B.)*	395	0	0
Contributions by local authorities - - - -	313	2	8

Scheme approved 8th December 1906.

Allocation of grant:—

I.—SECONDARY EDUCATION.

A. Bursaries:—

I. Intermediate Bursaries, awarded as far as possible on the principle of one Bursary to each Primary School, tenable for three years at schools recognised as qualified to prepare for the Intermediate Certificate. A limited number, of a minimum value of 3*l.*, are open to pupils who have attended an Intermediate or Secondary School for at least one year, and who are 14 years of age. Applicants from Primary Schools must have attended thereat for at least one year, must be between 12 and 15 years of age, and must have passed the Qualifying Examination (Article 29 of the Code); the value of the Bursary for the first year in these cases is not less than 3*l.*, or where continuous residence from home is involved, not less than 15*l.* Payment of travelling expenses may also be made where necessary, and a premium may be paid to the teacher for each successful pupil.

II. Secondary Bursaries open to pupils (with a preference to Junior Students) who, having gained the Intermediate Certificate, proceed to or continue at schools recognised as qualified to prepare for the full Leaving Certificate, of the maximum value of 20*l.* where continuous residence from home is necessary, and in other cases, of amounts determined by the particular circumstances of each case.

B. Subsidies to Intermediate and Secondary Schools:—

(a) To Inverness Royal Academy, on condition that free education be given to the Committee's Bursars = 100*l.*

(b) A commuted and inclusive payment of 50*l.* to each of the following schools:—

Kilmallie, Fort William Higher Grade Public School.
Kingussie Higher Grade Public School.
Portree „ „ „ „
Urquhart, etc., Glen Urquhart Higher Grade Public School.

Expenses of Committee = 90*l.*

II.—Technical Education.

A. Bursaries under previous schemes.

B. Courses for the further instruction of Pupil Teachers (under the Continuation Class Code).

C. Special Grant of 75*l.* to Inverness (Burgh) Higher Grade Public School, on condition that the School, with its Technical and Science Staff and equipment, be available to County Pupils or Teachers.

D. A grant of 50*l.* to Aberdeen and North of Scotland Agricultural College.

The Committee reserve the liberty to subsidise, with the Department's sanction, any other recognised branch of Technical Education.

KINCARDINE COUNTY.

	£	s.	d.
Grant for year ended 31st March 1908:—			
Under the Minute of 10th June 1897	534	19	4
„ „ *9th March* 1907	267	19	6
Contributions by local authorities	244	7	5

Scheme approved 28th January 1907.

Allocation of grant:—

	£
1. To Stonehaven Mackie Academy, conditional upon the provision of ten free places	360
2. To Montrose Academy, conditional upon the provision of six free places	60
3. To Banchory Ternan Central Public School, to assist in obtaining Higher Grade recognition	60

4.—(**1**) Secondary Bursaries, open to pupils who, having obtained the Intermediate Certificate, desire to continue their education at a Secondary School, and tenable for three years (or until the Leaving Certificate or Junior Student Certificate is obtained) at a school approved by the Department in the case of Junior Students, and at any Secondary School in the county or within four miles thereof in the case of other pupils.

(**2**) Intermediate Bursaries, tenable as a rule for three years, open to pupils who are, ordinarily, under 13 and who, having qualified in terms of Article 29 of the Code, desire to proceed to an Intermediate or Secondary School to obtain the Intermediate Certificate.

As far as possible, the Bursaries will be distributed over the parishes from which applicants are drawn, on the principle of one Bursary to a Parish.

5. A sum of 15*s.* for teachers, on account of each pupil passing into and remaining at least one year at a school in which Bursaries under Head 4 (2) may be held.

6. For class fees and travelling expenses of teachers obtaining a diploma after a course of instruction under Article 55 of the Regulations for the Preliminary Education, etc., of Teachers = 40*l.*

7. To schools other than those under Heads 1 to 3, for classes under the Continuation Class Code, under certain conditions, a grant of 3*s.* 4*d.* for theoretical, and 6*s.* 8*d.* for practical instruction per pupil per hour per week, for a minimum session of 15 weeks.

8. Balance, subject to expenses of Committee, to remain in hand for future application.

KINROSS COUNTY.

Grant for year ended 31*st March* 1908 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - -	275	10	2
,, ,, ,, 9*th March* 1907 - - -	60	8	2

Scheme approved 30*th January* 1907.

Allocation of grant :—

A. Intermediate Bursaries, of amounts varying according to the circumstances of each case, but not exceeding 3*l.* for the first two years and 5*l.* for the third, in addition to school fees and travelling expenses; open to candidates who have passed the Qualifying Examination (preference being given to those who pass between 12 and 13) and who intend to enter an approved school to study for the Intermediate Certificate. The Bursaries will be awarded as far as possible on the principle of one Bursary to each school with a qualified Candidate.

B. Secondary Bursaries, awarded by methods similar to those for the Intermediate Bursaries, of amounts not exceeding 8*l.* for the first year, 9*l.* for the second, and 10*l.* for the third, in addition to fees and travelling expenses, and tenable for two years, with an extension of one year if necessary, at approved schools, by pupils nominated as Junior Students, and others who have obtained the Intermediate Certificate or similar qualification.

KIRKCUDBRIGHT COUNTY.

Grant for year ended 31*st March* 1908 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - -	619	13	3
,, ,, ,, 9*th March* 1907 - - -	335	14	7
Contributions by local authorities - - - -	310	8	9

Scheme approved 15*th January* 1907.

Allocation of grant :—

I.—Secondary Education Funds.

3. The grants to schools are conditional upon the provision of free education in terms of section 2 of Head 8 below.

	£
4. To Kirkcudbright Academy - - - -	200
5. To Dumfries Academy - - - - -	90
To Newton Stewart, Ewart and Douglas High Schools -	45

6. Payment of fees to the above three schools on account of the Committee's Bursars in excess of 20 at Kirkcudbright Academy, 12 at Dumfries Academy, and 6 at Newton Stewart, Ewart and Douglas High Schools.

	£
7. To Kelton, Castle-Douglas Higher Grade Public School -	90
To Urr, Dalbeattie ,, ,, ,, ,, -	90

8.—(**1**) (*a*) Secondary Bursaries, of not less that 10*l.*, and (*b*) Intermediate Bursaries, of not less than 5*l.*, but these amounts may be increased in special circumstances.

(**2**) Free Places, as follows:—12 at Kirkcudbright Academy, 8 at Dumfries Academy, and 4 at the Ewart and Douglas High Schools. The Bursaries and Free Places to be equitably distributed over the schools having qualified applicants = (about) 300*l.*

9.—(**1**) Secondary Bursaries are open only to Candidates who hold the Intermediate Certificate, and who agree to follow either an approved Junior Student Course, or a curriculum leading up to the Leaving Certificate, preference to be given to the claims of Junior Students.

Intermediate Bursaries and Free Places are open to pupils, not over 13, who agree to study for the Intermediate Certificate; for the former, pupils must reside more, and for the latter less, than four miles from one of the schools under Heads 4, 5 and 7.

(**2**) Bursaries and Free Places are tenable for three years, or until the award of the certificate aimed at in each case, and in addition to the Bursary will entitle the holder (*a*) of a Secondary Bursary to free education at an approved centre; (*b*) of an Intermediate Bursary to free secondary and technical education according to the curriculum of the school attended, and (*c*) of a Free Place to free secondary and technical education according to the curriculum of the school in which the Free Place is held.

II.—Technical Education Funds.

		£
11.	From the contribution by the County Council:—	
	To Kelton, Castle Douglas Higher Grade Public School	70
	To Urr, Dalbeattie " " " "	70
	To Kirkcudbright Academy - - - -	60
12.	Towards Bursaries under Head 8 - - -	60

13. Grants handed over by the Burgh of Kirkcudbright, and by the Town Councils of Castle Douglas and Maxwelltown, to be paid to the following schools respectively:—

	£	*s.*	*d.*
Kirkcudbright Academy - - -	20	1	5
Kelton Castle Douglas Higher Grade Public School - - - - -	20	0	0
Dumfries Academy - - -	10	0	0
Expenses of Committee - - - -	40	0	0

LANARK COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1908:—			
Under the Minute of 10*th June* 1897 - - -	5,333	5	2
" " " " 9*th March* 1907 - - -	4,106	12	2

Scheme approved 18*th July* 1907.

		£
Allocation of grant:—		
(**a**)	Expenses of Committee - - - -	150
(**b**)	Special grant to Hamilton Academy - - -	200
(**c**)	Additional fixed grant to Hamilton Academy - -	450
(**d**)	Grants in proportion to, but not exceeding three-fourths of, the certified deficiency in respect of the following Higher Grade Schools - - - - - - -	3,400

Airdrie Academy Higher Grade Public School.
Avondale, Strathaven Academy Higher Grade Public School.
Biggar Higher Grade Public School.
Bothwell, Bellshill Academy Higher Grade Public School.
Bothwell, Elmwood Convent Higher Grade Roman Catholic School.
Bothwell, Uddingston Grammar Higher Grade Public School.
Cambuslang, West Coats Higher Grade Public School.
Cambusnethan, Wishaw Higher Grade Public School.
Carluke Higher Grade Public School.
Dalziel Higher Grade Public School.
Dalziel, Motherwell Higher Grade Roman Catholic School.
Hamilton (Landward), Low Waters Higher Grade Public School.
Lanark (Burgh) Grammar Higher Grade Public School.
Larkhall Academy Higher Grade Public School.

Lesmahagow Senior Higher Grade Public School.
Maryhill, North Kelvinside Higher Grade Public School.
Old Monkland, Coatbridge Higher Grade Public School.
Ruthergien, Stonelaw Higher Grade Public School.
Shettleston, Eastbank Higher Grade Public School.
Springburn Higher Grade Public School.

Lenzie Academy Higher Grade Public School
(in respect of pupils from Lanarkshire).

Fee-paying schools must provide free places, to be at the disposal of the Committee, at the rate of one for every 10*l.* of grant obtained.

(**e**) A Grant of 1*l.* to the headmaster of any non-central school, for each pupil who has passed the Qualifying Examination, and has completed one year in an approved Secondary Department - - £ 400

(**f**) Payments to Bursars under former schemes - - - 500

(**g**)—**1.** Intermediate Bursaries of the minimum value 5*l.*, open to pupils who, having passed the Qualifying Examination, have proceeded or are about to proceed to an Intermediate or Secondary School to study for the Intermediate Certificate; preference given to pupils whose attendance at a central school will involve outlay on travelling or maintenance; other pupils must be over 14.

2. Secondary Bursaries, of the minimum value of 12*l.* for boys and 10*l.* for girls, open to pupils who, having obtained the Intermediate Certificate, propose to continue their education at a Secondary School. A reasonable number of these Bursaries will be reserved for Junior Students.

Bursaries will be equitably distributed, as far as possible, over the schools from which applicants are drawn - - - - £ 3,500

LEITH BURGH.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1908:—			
Under the Minute of 10*th June* 1897 - - -	1,022	10	3
„ „ „ „ 9*th March* 1907 - - -	658	0	2

Scheme approved 13*th December* 1906.

Allocation of grant:—

	£	*s.*	*d.*
I. To Leith Academy Higher Grade Public School -	476	0	0
„ „ Trinity Academy Higher Grade Public School	176	0	0
II. Two silver medals to the boy and girl obtaining the highest marks in the third year's course at the schools under Head I. - - -	4	5	0
III. Bursaries, as follows, at the schools under Head I. -	883	0	0

Division I.—Twenty-five Intermediate Bursaries, of 2*l.* for each of the first two years, and of 5*l.* for the third, tenable by pupils over 13 years of age qualified in terms of Article 29 of the Code, at one of the schools under Head I. One bursary to be awarded to each school with a qualified applicant in the first place, and thereafter, bursaries to the pupils with the next best records according to the number of applicants from each school.

Division II.—Secondary Bursaries of 8*l.* for the first year, 10*l.* for the second, and 12*l.* for the third in the case of Girls; and of 10*l.* for the first year, 12*l.* for the second, and 15*l.* for the third, in the case of Boys; open to pupils who hold the Intermediate Certificate, and tenable for one, two or three years, according to the Course to be followed.

Of the total of 883*l.* under this Head, 300*l.* or thereabouts to be paid over to the School Board of Leith as required by the Regulations for the Preliminary Education, &c., of Teachers.

IV. To Leith Technical College:—

(**a**) 50*l.* towards salaries of teachers giving instruction under the Continuation Class Code.

(**b**) 50*l.* for bursaries, under a special scheme, of amounts ranging from 10*s.* to 2*l.*, and carrying exemption from the payment of fees for the following session.

V. Expenses of Committee = 41*l.* 5*s.* 3*d.*

LINLITHGOW COUNTY.

Grant for year ended 31*st March* 1908:—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	905	14	4
„ „ „ „ 9*th March* 1907 - - -	564	11	5
Contributions by local authorities - - - -	799	13	10

Secondary and Technical Schemes approved 10*th January* 1907.

Allocation of grant:—

Secondary Education.

£

A.—(*a*) To Linlithgow Academy - - - - - 200

(*b*) One half the certified deficiency, but not exceeding the following amounts, to:—

Bathgate (Town) Academy Higher Grade School - - 180

Bo'ness Academy Higher Grade Public School - - - 180

B.—(*a*) Secondary Bursaries, of amounts determined by the circumstances of the parents and by the distance of home from school, tenable at an approved school for three years, or until the award of the Leaving Certificate or Junior Student Certificate. Intermediate Bursaries of amounts dependent on circumstances as in the case of Secondary Bursaries, to pupils under 14, tenable for three years, or until the award of the Intermediate Certificate; and travelling, maintenance, or other expenses of Bursars - - - - 600

(*b*) Expenses of Committee - - - - - - 120

C. From any balance, further grants to the schools under Head A, in proportion to their certified deficiencies.

Technical Education.

I. Special Technical Classes:—

(*a*) Classes conducted by the Committee in Mining, Building Construction, Machine Construction, Shorthand and Practical Mathematics, for a course of three years, and in Cookery, at Bo'ness, Linlithgow, Bathgate, Broxburn, Fauldhouse and Livingston; and a Day Class in Drawing for Pupil Teachers at Bathgate.

Students, excepting Pupil Teachers, living three miles or more from place where Classes are held may be allowed their railway fares, subject to certificates of regular attendance and satisfactory progress.

(*b*) Subject to certificates of regular attendance, students who have satisfactorily attended for three sessions the classes under Head I. (*a*) may be allowed fares to enable them to attend more advanced classes outside the County.

(*c*) To the Edinburgh and East of Scotland College of Agriculture, 100*l.*

II. The grants to students from a Burgh retaining any portion of its Residue Grant, to be reduced by the amount so retained.

NAIRN COUNTY.

Grant for year ended 31*st March* 1908 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	292	12	7
„ „ „ „ 9*th March* 1907 - - -	74	2	2

Scheme approved 23*rd January* 1907.

Allocation of grant :—

	£
1. To be applied in payment of existing Secondary School Bursary. This Bursary will not be renewed after present Bursar's tenure -	30
2. To Nairn, Rose's Academical Institution, conditional upon the provision of free education for all pupils from the Burgh and County of Nairn who have passed the Qualifying Examination, and to all Bursars under the Committee's scheme - - - - -	200

3. Intermediate Bursaries, tenable for not more than three years at the Academy, open to pupils who have passed the Qualifying Examination.

4. Secondary Bursaries, tenable for not more than three years at the Academy, open to pupils who have obtained the Intermediate Certificate.

6. Travelling expenses and maintenance allowances may be added to either class of bursary.

7. Under deduction of expenses of Committee, the remainder of the grants will be paid to the Academy.

ORKNEY COUNTY.

Grant for year ended 31*st March* 1908 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	504	16	6
„ „ „ „ 9*th March* 1907 - - -	243	17	2
„ „ „ „ „ „ „ (*2nd para. of* § *II. B.*) -	224	0	0

Scheme approved 11*th September* 1907.

Allocation of grant :—	£
1. Expenses of Committee - - - - - -	45
2. To Kirkwall (Burgh) Higher Grade Public School - -	180
„ Stromness „ „ „ „ - -	100

These grants are conditional upon the provision of free education for the Committee's Bursars, &c.

3.—(**A**) Intermediate Bursaries, open to pupils who have not yet obtained the Intermediate Certificate and who are over 12 years of age, have passed the Qualifying Examination, and are attending approved Centres. Where pupils are under 14, allowances will be payable only in cases where attendance at the Centre involves outlay on travelling and maintenance, &c.

(**B**) Secondary Bursaries, open to pupils who have obtained the Intermediate Certificate, to enable them to pursue a full secondary course, including provision for accepted Junior Students.

PEEBLES COUNTY.

Grant for year ended 31*st March* 1908 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	359	13	8
„ „ „ „ 9*th March* 1907 - - -	127	14	11

Scheme approved 6*th July* 1907.

Allocation of grant :—

I. Secondary and Intermediate Bursaries, which may be sufficient to defray—(1) All fees; (2) Reasonable travelling expenses; and (3) Maintenance allowances when necessary, awarded as far as possible on the principle of one bursary to each parish with a qualified applicant = 127*l.* 14*s.* 11*d.*

A.—(**1**) Intermediate Bursaries are tenable for three years, or until the Intermediate Certificate is obtained, by pupils at least 12 years of age, qualified in terms of Article 29 of the Code. Pupils residing within three miles from school are entitled to school fees only (if any).

(**2**) Secondary Bursaries are tenable for three years at an approved school, or until the Leaving Certificate (or Junior Student Certificate) has been obtained, by pupils who hold the Intermediate Certificate; certain of these bursaries to be reserved for Junior Students.

B. A grant of 1*l.* to teachers of schools not otherwise in receipt of aid under the Scheme, in respect of each pupil who has passed the Qualifying Examination, passing from their schools into an approved Secondary School, with a further grant of 1*l.* on pupil obtaining the Intermediate Certificate. In the case of Peebles Kingsland School special grants only given for all pupils in excess of seven annually passing into Peebles Burgh and County High School.

II. To Peebles Burgh and County High School, 335*l.* out of the sum of 359*l.* 13*s.* 8*d.*, the balance being meantime retained to meet expenses of Committee.

PERTH COUNTY.

Grant for year ended 31*st March* 1908:—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - -	1,512	4	7
„ „ „ 9*th March* 1907 - -	1,049	15	9

Scheme approved 10*th December* 1906.

Allocation of grant:—

I. Secondary Schools—1,200*l.* to be allocated as follows:—

(**1**) Three-fourths of the certified deficiency in the first two cases, and the whole in the last two, but not exceeding the following sums:—

	£
Perth Academy - - - -	480
Callander, McLaren High School - -	130
Perth, Sharp's Institution - - -	230
Crieff, Morrison's Academy - - -	230

(**2**) The balance to be allocated amongst these schools after consideration of the efficiency of each.

II. Intermediate Schools.—250*l.* to be allocated as follows:—

(**1**) Three-fourths of the certified deficiency, but not exceeding the following sums, to:—

	£
Blairgowrie Higher Grade Public School - -	90
Dull, Aberfeldy „ „ „ „ -	65
Moulin, Pitlochry „ „ „ „ -	65

(**2**) The balance to be allocated among the three schools, after consideration of the efficiency of each.

IV. Expenses of Committee - - - (about) £50.

V.—**A.** Secondary Bursaries, not exceeding 12*l.* each, open to pupils qualified for the Intermediate Certificate, and tenable for not more than three years, ceasing when the holder has obtained the Leaving Certificate. Allowances may also be given, determined by the circumstances of each case.

B. Intermediate Bursaries, of 2*l.* for the first year, 5*l.* for the second, and 8*l.* for the third, to enable pupils who are 12 years of age and have passed the Qualifying Examination (Article 29 of Code) to proceed to or continue at an Intermediate or Secondary School, and tenable for not more than three years; ceasing when the holder has qualified for the Intermediate Certificate. Allowances may also be given, determined by the circumstances of each case.

RENFREW COUNTY.

Grant for year ended 31st March 1908 :—	£	*s.*	*d.*
Under the Minute of 10th June 1897 - -	3,314	2	3
„ „ „ *9th March* 1907 - -	2,491	5	8

Scheme approved 8th July 1907.

Allocation of grant :—

I. Payment of three-fourths of the certified deficiency, but not exceeding the following sums, to :—

	£
1. Paisley Grammar School and Wm. B. Barbour Academy	400
Greenock Academy - - - - -	400
2. Cathcart, Queen's Park Higher Grade Public School -	350
Eastwood, Shawland's Academy „ „ -	200
Greenock (Burgh), Holmscroft „ „ -	350
Neilston, Barrhead „ „ -	120
Paisley (Burgh), Camphill „ „ -	200
„ „ John Neilson Institution Higher Grade Public School - - -	200
„ „ St. Margaret's Higher Grade Roman Catholic School - - -	60
Port Glasgow, Jean Street Higher Grade Public School -	90

II. County Bursaries as follows :—

1. Secondary Bursaries of not less than 5*l.*, in such numbers as the funds may allow, tenable for two or three years by pupils who hold the Intermediate Certificate, to enable them to attend an approved Secondary or Higher Grade School with a view to obtaining the Leaving Certificate. In the case of Junior Students, studying for the Junior Student Certificate, these Bursaries may be increased by a maintenance grant not exceeding 9*l.* for males and 7*l.* for females.

2. Intermediate Bursaries, in such numbers as the funds may allow, to pupils who have passed the Qualifying (or an equivalent) Examination (Article 29 of Code), entitling the holder to free education for three years, (or until the Intermediate Examination is passed), at a Higher Grade School, or in certain approved cases at a selected Secondary School. Intermediate Bursars, as well as a limited number of other pupils, entering on the third year of an Intermediate Course may receive a Bursary of 5*l.* for that year.

The school fees of Bursars, to an amount not exceeding 6*l.* per annum in each case, will be paid by the Committee when necessary, and the necessary travelling expenses of Bursars residing more than two miles from school. Special consideration to be given to Junior Students.

ROSS AND CROMARTY COUNTY.

Grant for year ended 31st March 1908 :—	£	*s.*	*d.*
Under the Minute of 10th June 1897 - - -	1,012	0	1
„ „ „ *9th March* 1907 - -	649	12	1
„ „ „ „ „ (*2nd para. of § II. B.*)	547	0	0
Contributions by local authorities - - - -	382	13	10

Scheme approved 22nd December 1906.

Allocation of grant :—

I.—Secondary Education.

A. Bursaries :—

I. Intermediate Bursaries, awarded as far as possible on the principle of one Bursary to each Primary School, tenable for at least three years, at a School recognised as qualified to prepare for the Intermediate Certificate. A limited number, of a minimum value of 3*l.*, are open to pupils who have attended any of the Schools under Head B. for at least one year, and who are 14 years of age. Applicants from Primary Schools must have attended thereat for at least one year, must be between 12 and 15 years of age, and

must have passed the Qualifying Examination (Article 29 I. of the Code); the value of the Bursary for the first year in these cases is not less than 3*l.*, or, where continuous residence from home is necessary, not less than 15*l.* Necessary travelling expenses may also be paid, and a premium may be paid to the teacher for each successful pupil.

II. Secondary Bursaries, open to pupils (with a preference to Junior Students) who, having gained the Intermediate Certificate, proceed to or continue at schools recognised as qualified to prepare for the full Leaving Certificate, of the maximum value of 20*l.* where continuous residence from home is necessary, and in other cases, of amounts determined by the particular circumstances of each case.

B. Subsidies to Intermediate and Secondary Schools for Bursaries, additional Teaching Staff, &c.:—

	£
1. Tain Royal Academy	100
2. Rosskeen, Invergordon Academy Higher Grade Public School	67
3. Dingwall Academy Higher Grade Public School	107
4. Lochbroom, Ullapool „ „ „ „	40
5. Rosemarkie, Fortrose Academy Higher Grade Public School	47
6. Cromarty Higher Grade Public School	34
7. Lochalsh, Plockton Higher Grade Public School	40
8. Stornoway, Nicolson Institute Higher Grade Public School	180
C. Expenses of Committee	45

II.—Technical Education.

I. Courses for the further instruction of Pupil Teachers (under the Continuation Class Code).

II. Special Grants, under certain conditions, towards cost of Special Staff for Technical Instruction:—

	£
Tain Royal Academy	70
Dingwall Academy Higher Grade Public School	70
Stornoway, Nicolson Institute Higher Grade Public School	70
Rosskeen, Invergordon Academy Higher Grade Public School	45
Rosemarkie, Fortrose Academy Higher Grade Public School	20

III. Two Bursaries, to be awarded every third year, of £25 each, tenable for three years at any recognised Agricultural or Technical College.

The Committee reserve the liberty to subsidise, with the Department's sanction, any other recognised branch of Technical Education.

ROXBURGH COUNTY.

	£	*s.*	*d.*
Grant for year ended 31*st March* 1908:—			
Under the Minute of 10*th June* 1897	715	2	9
„ „ „ „ 9*th March* 1907	412	2	2
Contributions by local authorities	595	8	8

Scheme approved 10*th July* 1907.

Allocation of grant:—

Secondary Education.

I.—*General Scheme.*

	£
1. Expenses of Committee	55

		£
2.	Fixed subsidies as follows :—	
	(*a*) Kelso High School	380
	(*b*) Hawick (Burgh), Buccleuch Higher Grade Public School	180
	(*c*) To Jedburgh (Burgh) Grammar Higher Grade Public School	85

3. Grants and subsidies to be subject to conditions laid down in Department's Minute of 10th June 1897.

4. Any surplus on this part of the scheme to be transferred to the funds dealt with under Branch II.

II.—*Bursary Scheme.*

Intermediate and Secondary Bursaries, of amounts determined by the Committee, and intended to cover (*a*) all fees, (*b*) reasonable travelling expenses, and (*c*) maintenance allowances when necessary.

Intermediate Bursaries are open to pupils of at least 12 years of age, qualified in terms of Article 29 of the Code and tenable for three years or until the Intermediate Certificate is gained. In the case of pupils residing within three miles of the approved school, the school fees only (if any) are payable.

Secondary Bursaries are tenable for three years, or until the Leaving or Junior Student Certificate is gained, by pupils who hold the Intermediate Certificate, and who undertake to enter on a curriculum leading up to Leaving Certificate, at an approved School.

As far as possible, the Bursaries to be awarded on the principle of one Bursary to each School with a qualified applicant.

	Technical Education.	£
1.	(*a*) To Kelso High School	250
	(*b*) „ Hawick (Burgh), Buccleuch Higher Grade Public School	125
	(*c*) „ Jedburgh (Burgh) Grammar Higher Grade Public School	50
2.	To the Edinburgh and East of Scotland College of Agriculture	150

3. Balance to be divided between the three Schools under Head 1, in proportion to the fixed subsidies payable thereunder.

SELKIRK COUNTY.

Grant for year ended 31*st March* 1908 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897	448	8	3
„ „ „ „ 9*th March* 1907	198	14	8

Scheme approved 6th July 1907.

Allocation of grant :—

(**1**) Subject to the approval by the Scotch Education Department before 1st October next of a curriculum for the purposes of the Intermediate Certificate, to Yarrow Public School, a grant equal to one-half of such extra expense as shall be shown by its accounts to have been incurred in maintaining an advanced department, said grant not to exceed 25*l.*

		£	*s.*	*d.*
(**2**)	Bursaries under previous schemes	24	0	0
(**3**)	Three Secondary Bursaries to Junior Students (1906–7)	60	0	0
(**4**)	Eleven „ „ „ „ (1907–8)	156	10	0
(**5**)	Subject to Expenses of Committee, one-third to Selkirk High School, and two-thirds to Galashiels Academy	350	0	0
(**6**)	Balance carried to Bursary Fund	31	12	11

Bursaries are of two kinds—Intermediate and Secondary—and are intended to cover fees, and travelling and maintenance expenses, the

amounts being determined by the Committee in each case. Intermediate Bursaries are tenable for three years, or until the Intermediate Certificate is obtained, open to pupils qualified in terms of Article 29 of the Code who are at least 12 years of age, who undertake to carry out the three years' curriculum which would entitle them to the Intermediate Certificate, at a school approved for the purpose, and who reside over three miles from the approved school.

Secondary Bursaries are tenable for three years, or until the Leaving or Junior Student Certificate is obtained, open to pupils who hold the Intermediate Certificate and undertake to enter on a curriculum leading up to the Leaving Certificate at an approved school; certain of these Bursaries are reserved for Junior Students.

Bursaries to be awarded as far as possible on the principle of one Bursary to each school with a qualified applicant.

SHETLAND COUNTY.

Grant for year ended 31*st March* 1908:—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - -	499	3	3
„ „ „ „ 9*th March* 1907 - - -	239	6	7
„ „ „ „ „ „ „ (2*nd para. of* § *II. B.*)	135	0	0

Scheme approved, 12*th March* 1907.

Allocation of grant:—

I. Bursaries for (*a*) Intermediate Students, and (*b*) Junior Students and Leaving Certificate Students, tenable for one year (but renewable) at a Higher Grade Centre, and allotted as far as possible on the principle of one bursary to each of six districts = 370*l.*

Candidates desiring to enter on the Intermediate Course must have attained the age of 12, and must have passed the Qualifying Examination (Article 29 of Code).

Candidates desiring to enter as Junior Students, or for the Leaving Certificate Course, must have obtained the Intermediate Certificate, and Junior Student candidates must afford satisfactory evidence of their fitness to follow out their training.

II. A grant of 5*l.* under certain conditions, to the teacher of any State-aided School presenting a pupil or pupils successfully for the Committee's Bursaries for Intermediate Students.

III. Subject to Expenses of Committee, the balance, in so far as required, to go to Lerwick Anderson Educational Institute Higher Grade Public School, provided that education in secondary subjects be given free therein and that satisfactory arrangements are made for the training of Junior Students. Any balance to be applied to benefit of Committee's Bursaries.

STIRLING COUNTY.

Grant for the year ended 31*st March* 1908:—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - -	1,707	13	9
„ „ „ „ 9*th March* 1907 - - - -	1,206	3	0

Scheme approved 31*st August* 1907.

Allocation of grant:—

1. Payment of four-fifths of the certified deficiency, but not exceeding the following sums, to:—

	£
Stirling High School - - - - -	450
Falkirk „ „ - - - -	450
Grangemouth, Grange Higher Grade Public School	150
Kilsyth (Burgh) Academy Higher Grade Public School - - - - - -	120

4. Bursaries awarded under previous schemes.

5. Intermediate Bursaries, in such numbers as the Committee may determine, and varying in amount according to the circumstances of each case, open preferentially to pupils who have taken the Qualifying Certificate between 12 and 13, and tenable normally until the holder has been presented for the Intermediate Certificate.

A payment of 2*l.* may be made to Parish School Boards for each pupil who has been awarded a Bursary, but is receiving secondary instruction in the primary school pending an opportunity for transferring the pupil to an approved intermediate or secondary school.

6. Secondary Bursaries in such numbers as the Committee may determine and varying in amount according to the circumstances of each case, in addition to school fees and travelling expenses (or, in some cases, boarding allowances), open to candidates nominated as Junior Students, and also to other candidates who hold the Intermediate Certificate (or equivalent qualification), and tenable for two years, but renewable for a third year in individual cases.

Bursaries to be equitably distributed, as far as possible, over the schools from which qualified applicants are drawn.

SUTHERLAND COUNTY.

Grant for year ended 31*st March* 1908 :—	£	*s.*	*d.*
Under the Minute of 10*th June* 1897 - - - -	427	14	5
„ „ „ „ 9*th March* 1907 - - - -	182	3	7
„ „ „ „ „ „ „ (2*nd para. of* § *II. B.*)	195	0	0
Contributions by local authorities - - - - -	181	13	3

Scheme approved 6th September 1907.

Allocation of grant :—

A. Subsidies to Central Schools.—Payment of three-fourths of the certified deficiency, but not exceeding the following sums, to :—

	£
Clyne Higher Grade Public School - - -	60
Dornoch Burgh Higher Grade Public School -	60
Golspie Higher Grade Public School - - -	60
Kildonan, Helmsdale Higher Grade Public School - - - - - - - -	60
Lairg Higher Grade Public School - - -	60

B.—I. Bursaries :—

I. Thirteen Intermediate Bursaries (7 to Secondary Account and 6 to Technical Account) of not more than 15*l.* tenable for three years at a Higher Grade or Higher Class Public School approved by the Committee by pupils under 13, in certain specified parishes. Where the pupil resides at home, but over three miles from School, the bursary may be replaced by the payment of travelling expenses up to 5*l.* per annum - - - £120

II. Bursaries of 30*l.* per annum, tenable for three years at Golspie, Sutherland Technical Higher Grade School and open to pupils under 13 years of age - - - - - - - - - - - - - £150

III. Bursaries of not more than 5*l.* tenable for one year (but may be continued, in exceptional circumstances, for a second year, if funds permit) at any Higher Grade School in the County, open to pupils who have completed with credit the second year's course at any such school and who are over 14 and under 16 years of age, awarded on the principle of giving, as far as possible, one to each school - - - - - - - - - £50

B.—II. Bursaries for Junior Students of the maximum value of 17*l.* 10*s.* and tenable for three years - - - - - - - - - £90

C. Expenses of Committee = (about) 40*l.*

WIGTOWN COUNTY.

	£.	s.	d.
Grant for year ended 31st March 1908:—			
Under the Minute of 10th June 1897 - - - -	545	16	0
„ „ „ „ *9th March* 1907 - - - -	276	12	10
Contributions by local authorities - - - - -	19	11	9

Scheme approved 8th October 1907.

Allocation of grant:—

1. Grants to the following, subject to the provision of twenty Free Scholarships in the first case, and eight in the second:—

	£
Stranraer High School - - - - - -	100
Newton Stewart, Ewart and Douglas High Schools -	100

2. Further Grants as follows:—

Stranraer High School - - - - - -	140
Newton Stewart, Ewart and Douglas High Schools -	70

3. Conditions attaching to the above grants.

4. Five Secondary Bursaries of 10*l.*, which may be augmented by an allowance for travelling or maintenance - - - - - - - £60

5. The above Bursaries to be open to pupils who have obtained the Intermediate Certificate or equivalent qualification, and propose to continue their education at an approved Secondary School.

6. (1) Sixteen Intermediate Bursaries of 5*l.* (in lieu of fees, and not entitling the holder to free education), which may be augmented as with Secondary Bursaries - - - - - - - - - - - - £160

(2) Free Scholarships as provided for under Head 1.

7. Bursaries and Free Scholarships are tenable for three years, or until the certificate aimed at is obtained, and no candidate must be more than 13 years of age. Preference to be given to pupils to whom an Intermediate School is not easily accessible, and, as regards Intermediate Bursars, who have passed the Qualifying Examination.

8. Free Places under previous Schemes.

9. A capitation grant, not exceeding 2*l.*, to teachers of all rural schools (excluding schools in certain specified Burghs) in respect of each pupil who, after passing the Qualifying Examination, is transferred to a centre where he can have facilities for studying for the Intermediate Certificate - £70

10. Grant received from Burgh of Newton Stewart to be paid to the Ewart and Douglas High Schools = 19*l.* 2*s.* 0*d.*

11. Expenses of Committee = (about) 25*l.*

TABLE

STATEMENT showing separately for each SECONDARY EDUCATION COMMITTEE the Year ended 15th May 1908 and the number of Schools and individual

No.	Committee.	INCOME				
		1. Balance in hand on 15th May 1907.	2. Grants received from the Scotch Education Department.		3. Sums received from Local Authorities for Technical Education.	4. Bank (and other) Interest.
			Under the Education and Local Taxation Account (Scotland) Act, 1892.	Under the Minute of the Department dated 9th March 1907.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Aberdeen (Burgh)	915 13 6	1,830 8 4	1,304 6 7	—	19 6 2
2	Aberdeen (County)	3,197 5 11	1,902 17 0	1,362 5 6	628 17 1	109 14 1
3	Argyll	925 12 5	988 10 10	975 16 8	—	53 13 11
4	Ayr	6,803 7 11	2,906 0 11	2,164 16 9	3,459 10 11	261 15 4
5	Banff	1,220 16 7	—	525 0 7	48 8 6	27 0 11
6	Berwick	195 3 9	530 12 6	264 10 0	651 2 7	19 18 5
7	Bute	*1 4 5	399 10 11	159 12 8	—	11 10 7
8	Caithness	1,234 9 10	559 14 11	446 16 0	185 19 3	42 1 11
9	Clackmannan	109 13 2	538 17 11	271 2 4	13 19 1	8 2 2
10	Dumbarton	704 4 5	1,410 3 10	968 3 1	—	23 14 3
11	Dumfries	602 10 9	970 16 1	616 12 11	1,175 10 2	39 7 5
12	Dundee (Burgh)	706 10 0	1,911 17 9	1,369 10 2	—	46 6 4
13	Edinburgh (City)	1,747 1 6½	3,568 10 5	2,694 16 5	—	169 7 3
14	Edinburgh (County)	438 16 6	1,192 17 2	794 5 8	1,306 18 8	36 10 0
15	Elgin	184 0 7	672 12 10	378 2 3	215 6 9	9 5 11
16	Fife	3,523 18 4	2,524 7 9	1,859 10 2	2,601 19 11	182 17 6
17	Forfar	449 15 6	1,505 9 4	1,044 7 5	—	27 19 0
18	Glasgow (City)	1,436 3 0	6,822 1 0	5,297 12 10	—	217 12 9
18A	Govan	1,232 11 3	2,409 16 3	1,767 17 0	400 0 0	120 5 1
19	Haddington	572 10 7	610 13 6	328 10 10	67 5 11	23 14 11
20	Inverness	1,112 15 11	2,287 5 2	2,308 8 11	313 2 8	30 8 10
21	Kincardine	854 14 3	534 19 4	267 19 6	244 7 5	39 16 0
22	Kinross	148 3 5	275 10 2	60 8 2	—	7 19 10
23	Kirkcudbright	119 13 11	619 13 3	335 14 7	320 8 9	12 6 8
24	Lanark	3,558 17 7	5,333 5 2	4,106 12 2	—	269 3 8
24A	Leith (Burgh)	889 10 11½	1,022 10 3	658 0 2	—	30 12 10
25	Linlithgow	653 4 10	905 14 4	564 11 5	898 13 5	33 10 7
26	Nairn	9 6 3	292 12 7	74 2 2	—	2 11 10
27	Orkney	188 13 2	504 16 6	467 17 2	—	17 1 8
28	Peebles	39 4 8	359 13 8	127 14 11	—	4 17 6
29	Perth	1,723 14 6	1,512 4 7	1,049 15 9	—	57 12 4
30	Renfrew	3,481 10 7	3,314 2 3	2,491 5 8	—	245 8 6
31	Ross and Cromarty	1,895 19 3	1,012 0 1	1,196 12 1	382 13 10	107 4 5
32	Roxburgh	1,798 3 9	715 2 9	412 2 2	595 8 8	64 11 1
33	Selkirk	238 12 11	448 8 3	198 14 8	—	18 0 8
34	Stirling	1,031 19 9	1,707 13 9	1,206 3 0	—	58 2 7
35	Sutherland	953 8 1	427 14 5	377 3 7	181 13 3	46 19 1
36	Wigtown	352 13 4	545 16 0	276 12 10	19 11 9	21 11 0
37	Zetland	381 12 10	499 3 3	374 6 7	—	11 3 6
	Total	45,631 1 1	55,574 5 0	41,148 1 4	13,710 18 7	2,529 6 6

* Debit balance.

VII.

Sums actually Received and actually Expended under various Heads during the Scholars participating in the Grants paid under the various Heads.

5. From other sources.	Total Income.	EXPENDITURE. 1. Expenses of Committee.	2. Direct Subsidies to (a) Higher Class Schools.	(b) Higher Depts. of State-aided Schools.	Total.	*Number of Schools participating.*	No.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		
—	4,069 14 7	64 2 7	1,800 0 0	—	1,800 0 0	3	1
—	7,200 19 7	330 7 3	—	1,275 0 0	1,275 0 0	17	2
—	2,943 13 10	62 12 9	—	800 0 0	800 0 0	6	3
—	15,595 11 10	592 15 7	1,160 0 0	1,930 0 0	3,090 0 0	11	4
—	1,821 6 7	64 15 6	—	780 17 2	780 17 2	19	5
—	1,661 7 3	25 17 0	1,170 0 0	80 0 0	1,250 0 0	3	6
—	569 9 9	18 17 2	—	300 0 0	300 0 0	1	7
—	2,469 1 11	41 12 6	—	720 0 0	720 0 0	5	8
—	941 14 8	17 11 8	100 0 0	342 0 0	442 0 0	3	9
—	3,106 5 7	32 9 9	—	840 0 0	840 0 0	6	10
—	3,404 17 4	139 10 9	888 2 7	718 17 5	1,607 0 0	6	11
—	4,034 4 3	43 1 6	1,050 0 0	950 0 0	2,000 0 0	3	12
—	8,179 15 7½	224 11 5½	1,987 10 0	390 0 0	2,377 10 0	11	13
—	3,769 8 0	291 2 1	—	432 2 5	432 2 5	6	14
—	1,459 8 4	51 14 9	285 0 0	230 0 0	515 0 0	5	15
93 17 3	10,786 10 11	735 11 11	1,035 0 0	540 0 0	1,575 0 0	11	16
—	3,027 11 3	70 14 1½	—	—	—	—	17
—	13,773 9 7	95 10 9	3,025 0 0	2,075 0 0	5,100 0 0	11	18
—	5,930 9 7	32 18 3	639 0 0	2,041 0 0	2,680 0 0	10	18A
—	1,602 15 9	32 2 2	337 13 4	80 0 0	417 13 4	3	19
44 7 11	6,096 9 5	134 10 11	100 0 0	275 0 0	375 0 0	6	20
—	1,941 16 6	53 18 5	420 0 0	120 0	540 0 0	3	21
7 9 0	499 10 7	10 6 6	—	—	—	—	22
—	1,407 17 2	30 2 3	425 1 5	340 0 0	765 1 5	5	23
1,000 0 0	14,267 18 7	206 18 10	650 0 0	3,399 19 11	4,049 19 11	22	24
—	2,600 14 2½	49 15 1½	—	652 0 0	652 0 0	2	24A
—	3,055 14 7	414 7 3	—	680 0 0	680 0 0	3	25
—	378 12 10	22 0 9	219 0 0	—	219 0 0	1	26
—	1,178 8 6	45 19 0	—	250 0 0	250 0 0	2	27
—	531 10 9	15 0 10	344 4 8	—	344 4 8	1	28
—	4,343 7 2	50 0 0	1,200 0 0	250 0 0	1,450 0 0	7	29
—	9,532 7 0	172 17 5	1,160 0 0	1,512 0 0	2,672 0 0	11	30
—	4,594 9 8	100 5 4	170 0 0	640 0 0	810 0 0	8	31
621 7 9	4,206 16 2	58 3 1	617 11 11	885 0 1	1,502 12 0	3	32
—	903 16 6	24 8 6	325 11 6	—	325 11 6	2	33
—	4,003 19 1	18 19 9	700 0 0	190 0 0	890 0 0	4	34
—	1,986 18 5	38 12 3	—	650 0 0	650 0 0	5	35
—	1,216 4 11	31 0 5	429 2 0	—	429 2 0	3	36
—	1,266 6 2	14 12 2	—	300 0 0	300 0 0	1	37
1,767 1 11	160,360 14 5	4,459 18 3½	20,237 17 5	24,668 17 0	44,906 14 5	229	

TABLE

STATEMENT showing separately for each SECONDARY EDUCATION COMMITTEE the Year ended

No.	Committee.	EXPENDITURE				
		3. Grants towards Building or Equipment of				4.
		(a) Higher Class Schools.	(b) Higher Depts. of State-aided Schools.	Total.	Number of Schools participating.	Grants to Teachers (or Schools) in respect of Scholars transferred to more advanced Schools or Departments.
			£ s. d.	£ s. d.		£ s. d.
1	Aberdeen (Burgh)	—	—	—	—	—
2	Aberdeen (County)	—	488 0 0	488 0 0	5	226 0 0
3	Argyll	—	—	—	—	—
4	Ayr	—	—	—	—	—
5	Banff	—	—	—	—	—
6	Berwick	—	—	—	—	—
7	Bute	—	—	—	—	—
8	Caithness	—	—	—	—	10 0 0
9	Clackmannan	—	—	—	—	—
10	Dumbarton	—	—	—	—	37 0 0
11	Dumfries	—	—	—	—	—
12	Dundee (Burgh)	—	—	—	—	—
13	Edinburgh (City)	—	—	—	—	—
14	Edinburgh (County)	—	—	—	—	31 10 0
15	Elgin	—	—	—	—	—
16	Fife	—	—	—	—	—
17	Forfar	—	—	—	—	1 0 0
18	Glasgow (City)	—	—	—	—	—
18A	Govan	—	—	—	—	—
19	Haddington	—	—	—	—	—
20	Inverness	—	—	—	—	25 0 0
21	Kincardine	—	—	—	—	36 15 0
22	Kinross	—	—	—	—	—
23	Kirkcudbright	—	—	—	—	—
24	Lanark	—	—	—	—	717 0 0
24A	Leith (Burgh)	—	—	—	—	—
25	Linlithgow	—	—	—	—	—
26	Nairn	—	—	—	—	—
27	Orkney	—	—	—	—	—
28	Peebles	—	—	—	—	—
29	Perth	—	—	—	—	—
30	Renfrew	—	—	—	—	—
31	Ross and Cromarty	—	—	—	—	47 0 0
32	Roxburgh	—	621 7 9	621 7 9	1	—
33	Selkirk	—	—	—	—	—
34	Stirling	—	—	—	—	242 0 0
35	Sutherland	—	—	—	—	—
36	Wigtown	—	—	—	—	—
37	Zetland	—	—	—	—	10 0 0
	Total	—	1,109 7 9	1,109 7 9	6	1,383 5 0

VII.—*continued.*

SUMS actually Received and actually Expended under various Heads during the 15th May 1908, &c.—*continued.*

—continued.

5. Bursaries and Maintenance or other Allowances.*													6.	7.	No.
(a) Intermediate Bursaries and Maintenance Allowances.			(b) Secondary Bursaries and Maintenance Allowances.						(c) Other Bursaries (at Universities, Technical Schools or Colleges, &c.).			Total.			Sum placed at the disposal of the School Board in terms of the Regulations for the Preliminary Education, &c., of Teachers.	Grants to Teachers in respect of their attendance at classes held under the Regulations for the Preliminary Education &c., of Teachers.	
			(i) To Junior Students.			(ii) To pupils other than Junior Students.											
No.	£	*s.* *d.*	*No.*	£	*s.* *d.*	*No.*	£	*s.* *d.*	*No.*	£	*s.* *d.*	*No.*	£	*s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	
3	15	0 0	—	—		—	—		—	—		*3*	15	0 0	1,750 0 0	—	1
140	373	0 0	*49*	380	10 0	*37*	392	10 0	—	—		*226*	1,146	0 0	—	—	2
72	675	0 0	*40*	168	6 8	*4*	17	10 0	—	—		*116*	860	16 8	—	—	3
233	765	4 4	*119*	1,184	15 0	*7*	29	15 0	*628*	882	17 1	*987*	2,862	11 5	—	—	4
28	86	3 0	*17*	158	9 0	—	—		—	—		*45*	244	12 0	—	—	5
18	138	7 4	*8*	37	10 0	*4*	18	0 0	*2*	2	0 0	*32*	195	17 4	—	—	6
28	178	0 0	*3*	27	0 0	*1*	6	0 0	—	—		*32*	211	0 0	—	—	7
59	437	15 0	*33*	375	0 0	*3*	21	0 0	*1*	60	0 0	*96*	893	15 0	—	—	8
16	70	0 0	*28*	269	18 0	*1*	9	10 0	—	—		*45*	349	8 0	—	—	9
95	269	4 11	*57*	536	14 9	*2*	22	10 0	—	—		*154*	828	9 8	—	—	10
133	620	17 6	*23*	232	10 9	*16*	116	11 9	*21*	61	18 10	*193*	1,031	18 10	—	—	11
—	—		—	—		*5*	12	10 0	—	—		*5*	12	10 0	221 0 0	—	12
73	324	10 0	*15*	183	0 0	*1*	12	0 0	—	—		*89*	519	10 0	2,196 0 0	—	13
100	162	19 11	*33*	444	2 3	*12*	238	14 0	—	—		*145*	845	16 2	—	—	14
30	129	3 3	*23*	166	0 0	*21*	161	13 5	*10*	43	16 8	*84*	500	13 4	—	—	15
201	849	13 0	*77*	440	10 6	*24*	141	5 0	*82*	74	10 3	*384*	1,505	18 9	—	23 2 6	16
12	20	12 6	*61*	435	10 0	*3*	14	10 1	—	—		*76*	470	12 7	—	—	17
134	277	9 0	*20*	151	10 0	*38*	257	2 0	—	—		*192*	686	1 0	779 15 0	—	18
28	140	0 0	*1*	15	0 0	—	—		—	—		*29*	155	0 0	655 0 0	—	18A
142	698	10 0	*35*	362	0 0	—	—		—	—		*177*	1,060	10 0	—	—	19
99	651	0 10	*29*	172	15 5	*54*	357	13 4	—	—		*182*	1,181	9 7	—	—	20
48	262	0 9	*9*	53	7 2	*5*	35	15 4	—	—		*62*	351	3 3	—	8 13 0	21
24	184	14 0	*5*	43	8 0	—	—		—	—		*29*	226	2 0	—	—	22
17	209	15 0	*16*	160	0 0	—	—		—	—		*33*	369	15 0	—	—	23
428	4,388	6 10	*207*	2,731	11 7	*9*	107	0 0	—	—		*644*	7,226	18 5	—	—	24
48	141	0 0	*1*	5	6 8	*26*	85	10 0	—	—		*75*	231	16 8	300 0 0	—	24A
80	183	8 8	*29*	220	14 4	—	—		*30*	31	15 5	*139*	435	18 5	—	—	25
6	30	0 0	*10*	71	3 10	*1*	30	0 0	—	—		*17*	131	3 10	—	—	26
100	322	0 0	*27*	91	0 0	*19*	93	0 0	—	—		*146*	506	0 0	—	—	27
11	51	10 0	*9*	78	10 0	—	—		—	—		*20*	130	0 0	—	—	28
78	403	10 0	*54*	562	0 0	*23*	246	0 0	—	—		*155*	1,211	10 0	—	—	29
177	914	3 9	*33*	422	14 0	*6*	52	18 6	—	—		*216*	1,389	16 3	—	—	30
55	556	0 0	*45*	352	7 0	*2*	20	0 0	—	—		*105*	928	7 0	—	—	31
56	225	18 2	*9*	113	1 0	*1*	6	0 0	—	—		*66*	344	19 2	—	3 0 0	32
5	54	0 0	*14*	164	19 0	*1*	3	15 0	—	—		*20*	222	14 0	—	—	33
93	876	15 9	*49*	742	6 8	*2*	25	16 6	—	—		*144*	1,644	18 11	—	—	34
27	210	0 0	*5*	67	0 0	—	—		*10*	225	0 0	*42*	502	0 0	—	—	35
24	168	17 10	*7*	89	7 6	—	—		—	—		*31*	258	5 4	—	—	36
19	210	0 0	—	—		*6*	71	5 0	—	—		*25*	281	5 0	—	—	37
2943	16,274	11 4	*1200*	11,709	19 1	*334*	2,605	14 11	*784*	1,381	18 3	*5261*	31,972	3 7	5,901 15 0	34 15 6	

* *See* Table IX.

TABLE VII.—*continued.*

STATEMENT showing separately for each SECONDARY EDUCATION COMMITTEE the SUMS actually Received and actually Expended under various Heads during the Year ended 15th May, 1908, &c.—*continued.*

No.	Committee.	EXPENDITURE—*cont.* 8. Special Payments for Technical Instruction.	9. Other Payments.	10. Total Expenditure.	*Total Number of Schools participating.*	*Total Number of Scholars on account of whom payments have been made.*	11. Balance in hand on 15th May 1908.	No.
		£ s. d.	£ s. d.	£ s. d.			£ s. d.	
1	Aberdeen (Burgh)	—	—	3,629 2 7	*3*	*3*	440 12 0	1
2	Aberdeen (County)	549 12 7	—	4,014 19 10	*19*	*226*	3,185 19 9	2
3	Argyll	—	—	1,723 9 5	*6*	*116*	1,220 4 5	3
4	Ayr	2,248 16 6	—	8,794 3 6	*11*	*987*	6,801 8 4	4
5	Banff	48 8 6	—	1,138 13 2	*19*	*45*	682 13 5	5
6	Berwick	50 0 0	—	1,521 14 4	*4*	*32*	139 12 11	6
7	Bute	—	—	529 17 2	*1*	*32*	39 12 7	7
8	Caithness	—	—	1,665 7 6	*5*	*96*	803 14 5	8
9	Clackmannan	—	—	808 19 8	*3*	*45*	132 15 0	9
10	Dumbarton	—	—	1,737 19 5	*6*	*154*	1,368 6 2	10
11	Dumfries	169 15 3	—	2,948 4 10	*6*	*193*	456 12 6	11
12	Dundee (Burgh)	—	—	2 276 11 6	*3*	*5*	1,757 12 9	12
13	Edinburgh (City)	—	—	5,317 11 5½	*11*	*89*	2,862 4 2	13
14	Edinburgh (County)	1,300 11 1	—	2,901 1 9	*8*	*145*	868 6 3	14
15	Elgin	—	—	1,067 8 1	*5*	*84*	392 0 3	15
16	Fife	2,405 9 9	—	6,245 2 11	*12*	*384*	4,541 8 0	16
17	Forfar	—	—	542 6 8½	—	*76*	2,485 4 6½	17
18	Glasgow (City)	—	470 0 0	7,131 6 9	*12*	*192*	6,642 2 10	18
18A	Govan	—	120 0 0	3,642 18 3	*10*	*29*	2,287 11 4	18A
19	Haddington	—	—	1,510 5 6	*3*	*177*	92 10 3	19
20	Inverness	50 0 0	11 0 0	1,777 0 6	*7*	*182*	4,319 8 11	20
21	Kincardine	—	—	990 9 8	*3*	*62*	951 6 10	21
22	Kinross	—	—	238 8 6	—	*29*	261 2 1	22
23	Kirkcudbright	—	—	1,164 18 8	*5*	*33*	242 18 6	23
24	Lanark	—	—	12,200 17 2	*22*	*644*	2,067 1 5	24
24A	Leith (Burgh)	100 0 0	3 19 3	1,337 11 0½	*3*	*75*	1,263 3 2	24A
25	Linlithgow	483 19 6	—	2,014 5 2	*4*	*139*	1,041 9 5	25
26	Nairn	—	—	372 4 7	*1*	*17*	6 8 3	26
27	Orkney	—	—	801 19 0	*2*	*146*	376 9 6	27
28	Peebles	—	—	489 5 6	*1*	*20*	42 5 3	28
29	Perth	—	—	2,711 10 0	*7*	*155*	1,631 17 2	29
30	Renfrew	—	—	4,234 13 8	*11*	*216*	5,297 13 4	30
31	Ross and Cromarty	52 7 11	—	1,938 0 3	*9*	*105*	2,656 9 5	31
32	Roxburgh	150 0 0	—	2,680 2 0	*4*	*66*	1,526 14 2	32
33	Selkirk	—	—	572 14 0	*2*	*20*	331 2 6	33
34	Stirling	—	—	2,795 18 8	*4*	*144*	1,208 0 5	34
35	Sutherland	—	—	1,190 12 3	*5*	*42*	796 6 2	35
36	Wigtown	—	—	718 7 9	*3*	*31*	497 17 2	36
37	Zetland	—	—	605 17 2	*1*	*25*	660 9 0	37
	Totals	7,609 1 1	604 19 3	97,981 19 10½	*241*	*5,261*	62,378 14 6½	

Table VIII.

Summary of the foregoing Statement, showing under various heads the total sums actually received and actually expended by Secondary Education Committees during the year ended 15th May 1908.

Income.

	£ s. d.	£ s. d.
1. *Balance in hand* on 15th May 1907 -	—	45,631 1 1
2. *Amount received from the Scotch Education Department* under Section 2 (1) (*b*) of the Education and Local Taxation Account (Scotland) Act, 1892 - - - -	55,574 5 0	
Under the Minute of 9th March 1907 -	41,148 1 4	
		96,722 6 4
3. *Contributions of local authorities* for purposes of technical education -		13,710 18 7
4. *Bank* and other interest - - -		2,529 6 6
5. *Other sources of income* - -		1,767 1 11
Total -		£160,360 14 5

Expenditure.

	£ s. d.	£ s. d.
1. *Expenses of Committees* - - -	—	4,459 18 3½
2.**Direct subsidies* to—		
(*a*) Higher Class Schools - -	20,237 17 5	
(*b*) Higher Departments of State-aided Schools - - -	24,668 17 0	
		44,906 14 5
3. *Grants towards Building or Equipment* of:—		
(*a*) Higher Class Schools - -	—	
(*b*) Higher Departments of State-aided Schools - - -	1,109 7 9	
		1,109 7 9
4. *Grants to Teachers (or, Schools)* in respect of Scholars transferred to more Advanced Schools or Departments - - - - -	—	1,383 5 0

* The payment of these subsidies is often conditional upon the provision of certain free places.

	£	s.	d.	£	s.	d.
5. *Bursaries* and *Maintenance or other Allowances*:—						
(*a*) Intermediate Bursaries and Maintenance Allowances -	16,274	11	4			
(*b*) Secondary Bursaries and Maintenance Allowances - -						
(*i*) To Junior Students -	11,709	19	1			
(*ii*) To pupils other than Junior Students -	2,605	14	11			
(*c*) Other Bursaries (at Universities, Technical Schools, or Colleges, &c.) - - - -	1,381	18	3			
				*31,972	3	7
6. Sums placed at the disposal of the School Board in terms of Article 57 of the Regulations for the Preliminary Education, &c., of Teachers - -	—			*5,901	15	0
7. Grants to Teachers in respect of their attendance at classes held under the Regulations for the Preliminary Education, &c., of Teachers - -	—			34	15	6
8. *Special payments for Technical Instruction* - - -	—			7,609	1	1
9. *Other payments under the Schemes* -	—			604	19	3
Total Expenditure - - - -				97,981	19	10½
Balance in hand on 15th May 1908 - -				62,378	14	6½
Total -				£160,360	14	5

TABLE IX.

Details of Expenditure by certain Burgh School Boards out of sums placed at their disposal by Secondary Education Committees, in terms of the Regulations for the Preliminary Education, &c., of Teachers, during the year ended 15th May 1908.

(*See columns 5 and 6 of Table VII.*)

School Boards.	Balance in hand on 15th May, 1907.	Sums placed at disposal of School Board by Secondary Education Committees.	Particulars of Expenditure by School Boards, out of sums placed at their disposal.						Balance in hand on 15th May, 1908.
			Intermediate Bursaries and Maintenance Allowances.		Secondary Bursaries and Maintenance Allowances.		Total.		
	£ s. d.	£ s. d.	No.	£ s. d.	No.	£ s. d.	No.	£ s. d.	£ s. d.
Aberdeen Burgh School Board.	—	1,750 0 0	82	263 0 0	48	232 10 0	130	495 10 0	1,254 10 0
Dundee Burgh School Board.	50 0 0	221 0 0	—	—	29	271 0 0	29	271 0 0	—
Edinburgh Burgh School Board.	19 10 0	2,196 0 0	—	—	164	1,102 15 0	164	1,102 15 0	1,112 15 0
Glasgow Burgh School Board.	‡0 10 0	779 15 0	—	—	115	779 15 0	115	779 15 0	†0 10 0
Govan Parish School Board.	—	655 0 0	74	370 0 0	18	285 0 0	92	655 0 0	—
Leith Burgh School Board.	—	300 0 0	—	—	35	317 6 8	35	317 6 8	†17 6 8
Totals -	69 0 0	5,901 15 0	156	633 0 0	409	2,988 6 8	565	3,621 6 8	2,349 8 4

* See Table IX. † Debit Balances.

‡ The debit balance of 5*l.* 10*s.* shown in last year's Report has been reduced by 5*l.*, representing a payment retained by the Board in respect of a bursar.

SCOTCH EDUCATION DEPARTMENT.

TRAINING OF TEACHERS.

REPORT, STATISTICS, &c.

1906-1907.

Presented to both Houses of Parliament by Command of His Majesty.

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1908.

[Cd. 4149.]

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NOTE.

The REGULATIONS FOR THE PRELIMINARY EDUCATION, TRAINING AND CERTIFICATION OF TEACHERS for various grades of Schools, together with the MINUTE OF 30TH JANUARY, 1905, establishing Provincial Committees for the Training of Teachers, and the MEMORANDUM OF 10TH SEPTEMBER, 1907, as to the Examination of Candidates for recognition as qualified Teachers of Modern Languages, are issued as a separate publication—[Cd. 4034.] *Price* 3½*d.* (*See* List on p. 2 of blue cover.)

EDUCATION (SCOTLAND).
TRAINING OF TEACHERS.

REPORT *for the Year* 1906–07, *by* A. E. SCOUGAL, Esq., M.A., LL.D., *His Majesty's Senior Chief Inspector of Schools and Inspector of Training Colleges in* SCOTLAND, *on the* TRAINING *of* TEACHERS.

MY LORDS,

I have the honour to present to Your Lordships my fourth General Report on the Training of Teachers in Scotland.

Special Character of Session 1906-7.—In my General Report for last year (session 1905-6) I expressed the anticipation that the session 1906-7 would prove to be mainly a further transition period, and that it would have to be devoted by the Provincial Committees chiefly to organization for passing as smoothly as possible from the old system to the new, and to preparation for the definite starting, at the beginning of session 1907-8, of the new system established by the Regulations of 7th June, 1906, for the Preliminary Education, Training and Certification of Teachers. This anticipation has proved to be entirely correct; and further, it is now evident that even the current session (1907-8) must also be in considerable measure one of a transitional character. Indeed, there will continue to be need for arrangements more or less transitional until, in the first place, the students who were admitted into training under the old system have been, so to speak, worked off, and until, in the second place, the Junior Student system inaugurated by the new Regulations has been so long in operation as to ensure that all candidates for admission to full training come forward possessing the Junior Student Certificate or its equivalent.

Consequent Lines of this Report.—In these circumstances, although, during the session 1906-7, with which this report deals, there have been important forward movements in the way of organization and of preparation for further developments, yet there has been practically no change, as compared with what obtained in the preceding session, in the methods and detailed arrangements in accordance with which the actual work of the further instruction and the training of the students has been carried on at the several centres and colleges. In the introductory section of this report I shall give a summarized account of the problems of re-organization that have had to be faced by the Provincial Committees during the session; and in the subsequent sections I shall, as in former years, present a conspectus of the work that has been done in the various branches of the curricula for the training of our teachers, as the results of that work have been ascertained and appraised by the several inspectors and examiners to whom Your Lordships have assigned this special duty.

10255. 75—Wt. 25808. 8/08. Wy. & S. 7030*r*. A 2

SECTION I.

General.

Increase in Number of Students in Training.—An important factor in the problem of organization falling to be dealt with this session has been the increase in the number of students admitted to full training. The number of students in attendance at the training centres during the session 1906-7 has been 2,195, an increase of 473 upon the numbers for session 1905-6. Of these 1,534 have been in attendance at the eight Training Colleges in Edinburgh, Glasgow, and Aberdeen; the other 661 have been students at the five Training Centres which were formerly managed by the Local Committees connected with the Universities, but which since 1st August, 1906, have been under the control of the respective Provincial Committees.

Causes of the Increase.—This large increase in the number of students in training is undoubtedly directly due to the new Regulations, the provisions of which took effect from the beginning of session 1906-07. Under the old system the only avenues of admission to full training were (1) the passing of the Preliminary Examination of any of the Scottish Universities; (2) the obtaining of certain specified successes in the higher grade at the Leaving Certificate Examination; and (3) the passing not lower than in the second class at the King's Scholarship Examination. To these avenues the new Regulations have added other two, by accepting as admissible to full training, first, Pupil-teachers who have passed the King's Scholarship Examination in the third class, and, secondly, Assistant Teachers and Provisionally Certificated Teachers (under the Code of 1906) who have served in state-aided schools in Scotland for not less than twelve months. Again, while under former Code provisions there were admissible to one year's training only Certificated Teachers who had not previously had the normal two years' training, and Graduates, the new Regulations admit also to one year's training any Acting Teachers who have in or before 1906 passed in the first year's papers of the Certificate Examination, or who since that date have been recognized by the Department as having obtained (at the Certificate Examination as reconstituted) the equivalent of a pass in first year's papers. And further, there has been this year a very considerable increase in the number of students who continue for a third year of training. Under the new Regulations it is the norm that all students in training who, possessing on admission the necessary preliminary qualifications, attend University classes shall remain in training for at least three years; formerly, a third year of training was allowed by the Department, on the special application of the Training Authorities, only to such of these students as were "students of special merit, for whom special educational opportunities were offered."

Acting Teachers admitted for One Year's Training.—The large attendance (88) this session of the non-certificated Acting Teachers now admitted for the first time to one year's regular training is a specially gratifying and encouraging feature of the new developments. The returns that I have already received for session 1907–08 indicate that the number of these applicants for training is steadily increasing. They are to be welcomed; for they form an interesting class of older students in training, who work with keenness and assiduity to take the utmost advantage of the opportunities which they have not had before; and the more of them who come forward, the sooner we shall eliminate the "untrained" element from the staffs of our schools, and the more speedy will be the realization of the ideal aimed at in the new Regulations, that "every teacher in a Scottish school shall be thoroughly trained for the work he is to undertake."

There are this year two further special causes of increase in the number of students in training.

New Centre of Training for University Students—at Edinburgh.—First, there was opened at the beginning of this session, in connection with the University of Edinburgh, and under the Edinburgh Provincial Committee, a new centre of training for University Students (or, to use the old term, King's Students), in addition to the former centres for King's Students under Local Committees in connection with the Universities of Aberdeen, Glasgow, and St. Andrews. At this new centre 103 University Students were admitted. To the zeal and unwearying labour of Professor Darroch, Professor of Education in the University of Edinburgh—who for eleven months self-sacrificingly acted as interim and honorary Director of Studies to the Provincial Committee—is more especially due the success which has attended the opening of this new centre for King's Students. An estimate of the quality of the training supplied will appear in its place in a later section of this report. Suffice it to say here that the provision made for these new students was planned with wisdom and foresight, and that the details of it have been carried out in a very efficient manner.

New Provision for Training made at Dundee.—Secondly, new and much needed additional facilities for the training of teachers have been provided at Dundee by the St. Andrews Provincial Committee. According to former arrangements, under the Dundee Local Committee, only King's (*i.e.* University) Students were admissible to training at the Centre connected with the Dundee University College. This session the St. Andrews Provincial Committee has made new provision at Dundee for the training of Non-University Students. For these new students (sixty in number) most convenient and suitable accommodation has been provided in the buildings of the Technical Institute, which immediately adjoin the premises of the Dundee University College. Mr. Malloch, formerly Director of Studies to the Dundee Local Committee, now Director of Studies under the St. Andrews Provincial Committee, has, with his wonted energy and skill

most successfully coped with the organization needed for the instruction and training of this new class of students; and all the arrangements made have been working with highly satisfactory smoothness and efficiency.

Appointments of Directors of Studies.—In accordance with the provisions of Clause XIII. of the Minute of 30th January, 1905, the Provincial Committees of Edinburgh, Glasgow, and Aberdeen at an early period of the session appointed their "Directors of Studies": the Edinburgh Committee, on the 10th of October, 1906, appointing Mr. John King, M.A., B.Sc., the Head Master of the Edinburgh Boroughmuir Higher Grade Public School; the Glasgow Committee, on the 30th of November, 1906, Mr. Donald Macleod, M.A., the Rector of the Hamilton Academy; and the Aberdeen Committee, on the 1st of January, 1907, Mr. George Smith, who prior to the changes brought about by the Minute had been for nine years Rector of the United Free Church Training College, Aberdeen. After interim separate arrangements for St. Andrews and Dundee, sanctioned temporarily by the Department in view of special circumstances, the St. Andrews Provincial Committee, on the 2nd of March, 1907, appointed as their Director of Studies Mr. James Malloch, M.A., who had been for years Lecturer on Education at the Dundee University College and also for years Director of Studies under the Dundee Local Committee for King's Students.

Transfer of the Presbyterian Training Colleges to the Provincial Committees.—In last year's report I spoke of the transfer of the buildings and management of the six Presbyterian Training Colleges to the respective Provincial Committees as an almost accomplished fact. Unexpected delay has occurred with regard to the due legal and legislative completion of the arrangements for this transfer, but pending the completion of these, a provisional agreement was come to, with the sanction of the Department, by which the Provincial Committees entered into working possession of the buildings of the Presbyterian Colleges and took over the working management of these colleges as from the 1st of May, 1907. It is satisfactory to learn that there is now every reason to expect that the Provisional Order which has been promoted for the purpose of formally legalizing the transfer of these colleges will be passed by the Legislature at an early period of the present session of Parliament.

Work continued on former lines till end of Session 1906–07.—From the 1st of May the session of the Training Colleges had only three months to run. It was felt to be unwise, even had it been practicable, to make any changes in time-table and staffing arrangements for this last quarter of the session 1906–07; and, accordingly, the work of the Training Colleges continued on the old lines until the colleges closed in the end of July for the summer vacation.

Reorganization Problems to be faced by the Provincial Committees.—As it had been agreed that from the 1st of August, 1907, the Provincial Committees of Edinburgh, Glasgow, and

Aberdeen should enter into full practical control of all the Presbyterian Training Colleges as part of the machinery at their disposal for the carrying out of the new system under the Regulations, these Provincial Committees found themselves face to face with the task of completing within but a limited time (the vacation months intervening) the organization needed to secure that the new system should start fair and in full working order at the beginning of the new session on the 1st of October, 1907. To this complex, difficult, and in several points delicate task the Committees applied themselves with such earnestness and assiduity as call for the very warmest and most grateful recognition. Indeed, it would be impossible to speak in terms of too high appreciation of the self-sacrificing labours of those members and officials of the Committees upon whom, owing to their special knowledge and experience in matters educational, the brunt of the battle fell during this period of emergency and stress. Such strenuous efforts have been rewarded as they deserved. It is a pleasure to report, speaking of the work of the Committees as a whole, that the new organization for the training of teachers in Scotland was launched at the beginning of the now current session (1907–08) with a most gratifying measure of smoothness and success. Where any slight hitches have occurred, these have been due to special local hindrances and difficulties which there is every reason to expect will be speedily removed.

Institution of a Joint Committee of the four Provincial Committees.—Experience of this work of reorganization soon showed that, while each Committee had its own special problems to deal with, there were certain matters of moment in connection with the general working of the new system in regard to which it was eminently desirable, indeed practically imperative, that the four Committees should take common action: such as—to specify only a few of the most important of these—the nature of the curricula to be proposed for the various classes of students admissible to training under the new Regulations; the conditions under which bursary allowances and payment of fees should be granted; the means to be taken for the care of the physical and moral welfare of the students, including difficult questions as to the supply and adequate supervision of sanctioned lodgings and of hostels. The securing of this desired common action has been greatly facilitated by the institution—at the suggestion of the Secretary of the Department—of a "Joint Committee" of the four Provincial Committees. This Joint Committee is composed of the Chairman, one elected representative, and the Director of Studies from each of the Provincial Committees, with the addition of myself as the Department's Assessor. It has already proved itself to be a most convenient and useful body for the preliminary consideration of all important matters in regard to which common action is thought desirable, and for direct consultation with the Department in regard to these, before they are finally sent down to be decided upon and dealt with by the several Provincial Committees.

Limitation of the lines of this Report.—It is not my purpose to enter in this year's report into any detailed remarks upon the many important questions as to curricula, bursary arrangements, staffing, housing of students, etc., etc., which have taken up so much of the time and thought of the Provincial Committees during the past session. As I have already explained, all the working arrangements for the session were based as far as possible on the lines of the already existing practice of the Training Colleges and the Local Committees; and I propose, therefore, to cast this report very much upon the old lines, deferring all discussion of questions connected with the great changes that are now taking place until there shall have been time to see the new organizations and arrangements in actual operation and to gauge to some extent at least the results of their working. Any such discussion now would, I feel, be premature, and probably misleading. For there is hardly one point in all this elaborate reorganization in regard to which our arrangements are not, even yet, in spite of so much care and anxious thought, necessarily and recognizedly provisional and tentative. Already it is becoming evident that many even of the arrangements determined on for the current session, and now in operation, will have to be considerably modified in the very near future.

Hostels.—On only one other matter connected with the general organization do I wish to make remark here. That is the question of Hostels. The Committees are unanimous in their opinion as to the great value of Hostels, for the sake alike of the physical, social, and moral well-being of the students —an opinion in which, from what I have seen of the benefits of the residential system in England, I most heartily concur; there are at present no such Hostels in Scotland under the cognizance of the Committees, save—with exceptions too small to be of any moment—the four very moderate-sized boarding houses (two in Edinburgh, one in Glasgow, and one in Aberdeen) for women students which have been made available for the Committees' students in connexion with the transfer of the Presbyterian Training Colleges, and which, taken together, can accommodate only a very small fraction (162 in all) of the total number even of the women students; and the Committees are besieged with applications for Hostel accommodation— mostly from the women, but in no small number from the men also—which, to their deep regret, they cannot meet. The Department has stated that "the Regulations contemplate that Hostels should be conducted by bodies other than the Provincial Committees—in particular, by Churches or Religious Associations." In view of the circumstances that I have just described, it is most earnestly to be hoped that the Churches and others, whether public bodies or private persons, who are interested in the well-being, moral and physical, of the young men and women who are to be the future teachers of the children of our country will show themselves alive, and that right early, to the vast amount of good they can do by providing suitable hostel accommodation for our students in training.

Suggestions as to Hostels from Observation of the English System.—For the information of any benefactors who may be inclined to give favourable consideration to practical measures for the provision of Hostels for our students, it may be in place here to mention the following conclusions as to Hostels which I was led to form from the tour of inspection that I was privileged, under sanction from Your Lordships, to make recently to certain of the English Training Centres:—

(1) Hostel life for our Students in Training is most desirable and valuable, from considerations of (*a*) health, (*b*) formation of regular habits of living, (*c*) education in manners, (*d*) formation of regular habits of study, and (*e*) moral education.

(2) Hostels for men are, if of the right type, of very special benefit.

(3) Hostels should preferably be of moderate size, providing accommodation for from 35 to 50 students.

(4) They should be suburban rather than situated in town streets, and should have a considerable amount of open recreation ground attached to them. Distance from the University, if not excessive, is more of an advantage than otherwise.

(5) Separate bedroom accommodation in them is greatly to be preferred to dormitory or cubicle arrangements.

(6) It is preferable that, wherever possible, a Hostel should be open to different classes or types of suitable resident; that is, should not be restricted to "Students in Training."

(7) The sum of £35 per year per student may be set down as the average of "reasonable" Hostel expenditure.

Local Problems of Organization and Working, as dealt with at the several Training Centres.—Each of the Training Centres had early in the session to deal with its own local problems as to how best to utilize existing staff, accommodation, equipment, and facilities for practical training so as to fit in with the new arrangements. To enter into detail as to how these problems were solved at each of the four centres is impossible here; a report in regard to the arrangements adopted must be made mainly in general terms. Speaking in such terms, I have to congratulate the Committees most heartily upon the judgment and skill that they have shown in making the very most of their several local resources and conditions. Unification of the formerly duplicated staffs, and the redistribution of the work among them so that each member of the staff has, as a rule, work only in one subject, and that the subject for which he is best fitted, have been improvements in organization which cannot but lead to increase of efficiency; for in each subject the students now have at their service the most skilled instruction at the disposal of the Committee, and each lecturer is now free to devote himself to a concentrated study of his own special subject and of how best to teach it. Existing buildings have been utilized with much skill to adapt them to the requirements of the new organization (the work in this respect at Edinburgh and at Aberdeen calling for special commendatory note); and this has been done at wonderfully little expense considering the great improvements effected. At

all the centres very satisfactory arrangements have been made with the local school boards for the wider facilities needed for the practical training of the greatly increased number of students; and the work under this important part of the training curriculum has been carried out with improved efficiency. It is but right and due that cordial recognition should be made here of the hearty co-operation of these school boards in this matter, as well as of the willingness, interest, zeal, and effectiveness with which, almost without exception, the headmasters and the assistant staffs of the various public schools to which our students have been sent for practical work have loyally aided the Committees' masters and mistresses of method. It would be unjust not to recognize also the judgment and tact which the masters and mistresses of method themselves have shown in connexion with this specially delicate part of their duties. Indeed, the spirit of genuine co-operation manifested by all concerned has been most gratifying and has contributed in no small measure to the successful start of the new training system.

Courses for the further Instruction of Teachers in Actual Service.—The taking over, in accordance with Article 55 of the new Regulations, of the duty of seeing to the provision of the "Courses for the Further Instruction of Teachers in Actual Service" which were formerly established and carried on by local bodies under Article 91 (*d*) of the Code has entailed much anxious and laborious work upon the central staffs of all the Provincial Committees. Full particulars of the courses of this kind that were held during session 1906–7—the number and distribution of such courses, the subjects taken up at each of them, and the number of students attending each—are given in an Appendix to this report. In all the special circumstances of this session I do not propose to enter into further details about them here. They undoubtedly form a very interesting and important part of the work of the Training Authorities; but some questions of moment concerning the conduct and the finance of these courses are still under consideration, and it would seem, therefore, to be as well to delay detailed report upon them until organization for them has been definitely settled and they have thereafter had time to show what permanent results may be expected from them.

Junior Student Centres.—The intimacy and the importance of the connexion between the Junior Student system and the after training of the Senior Student are obvious. All indications point to the conclusion that the old Pupil-teacher system will soon be a thing of the past; and therefore it is not too much to say even now that the period of the instruction and training of the Junior Student is the foundation stage of the whole new organization for the training of our teachers. In the laying of this foundation a most encouraging start has been made. There are now throughout Scotland 108 recognized Junior Student Centres, well distributed up and down the length and breadth of the country, 30 of them being situated in

the Southern Division, 40 in the Western Division, 27 in the Northern Division, and 11 in the recently constituted Highland Division. Of these 108 centres, 39 are to be found in secondary schools, 69 in higher grade schools. From the point of view of their management, 21 are under bodies of managers or governors other than school boards (4 being under Roman Catholic managers), and 87 are under school boards. Confining attention to the centres in the Southern Division—of which alone I have direct personal knowledge, as Chief Inspector of the Division—I note that of the 30 Junior Student Centres in that Division 18 are in secondary schools and 12 in higher grade schools (one of the latter being a recently established Roman Catholic school). In what I proceed to say about the instruction and training given in the Junior Student Centres I speak directly, of course, only with regard to the centres in my own Division; but from frequent conference with the Chief Inspectors of the other three Divisions I have no reason to believe that my experiences and opinions differ in any material respect from those of my colleagues.

The Instruction given at these Schools.—Preliminarily, it is to be noted concerning the higher grade schools which have been recognized as Junior Student Centres that these are, to all intents and purposes, Secondary, and not merely Intermediate schools, inasmuch as they have to provide at least a five and normally a six years' curriculum beyond the standard of the Qualifying Examination (Article 29 of the Code), and have to aim at reaching the Higher Grade standard for the Leaving Certificate in all the subjects of their approved curriculum.

While, at this early stage of the Junior Student system, only in the year of its initiation, it would be over-statement to say that the organization for all the work of this curriculum is now everywhere and in all respects complete, yet I can with every satisfaction report that excellent, rapid, and most encouraging progress towards the achievement of such organization has already been made; and, further, I do not hesitate to say that in respect of the efficiency of the instruction which is given in them the Junior Student Centres, taken as a whole, stand well to the front among the schools which furnish secondary education in Scotland.

The Practical Training of the Junior Students.—As to the practical training in the art of teaching which is provided for the Junior Students at these centres it is not yet possible to report in definite terms. The Junior Student system is still too young to justify any valid conclusions or specific criticisms on the point; and, further, the wide liberty purposely—and most wisely, I think—left, under the Regulations, to the Managers of these centres to work out in their own way the detailed arrangements for the provision of this practical training has led to such an almost bewildering variety in the arrangements adopted, that precise estimate of the results is, for the present at least, impossible. Subject to the one controlling limit of having to

assign to this work the minimum time laid down for it in the Regulations, the details of the arrangements made at the different centres have varied in almost every possible way—as regards, for example, the extent and the distribution of the time allotted to practical training, the staff employed to give it, the schools or the classes utilized for it, and the nature and the sequence of the subjects in which the Junior Students are set to practice. There is no reason to take exception to such variety. On the contrary, we are confessedly moving tentatively and feeling our way in the matter; and it has been a manifest advantage to secure, at the outset, such a varied range of practical experiment carried out independently by so many experienced, earnest, and skilled investigators and experimenters. At all the centres which have come under my inspection the work has been taken seriously, with a due realization of its importance, and Head Masters, Masters of Method, and Junior Students alike have, as a rule, thrown themselves heartily into it. It is a pleasure to report that, while amid such a variety of arrangements and method there have been of course not a few points of detail that call for criticism, I have found no centre where the tone in regard to this work was careless, or the carrying out of this important part of the Junior Students' training has been perfunctory or slipshod.

Encouraging Features of the Work of the Session. — This session of transition has been a somewhat unsettled, trying, and difficult one for all who are directly connected with the work of the training of teachers. In these circumstances it is most gratifying to me to be able to report here to Your Lordships that during the past session the whole work of the various Training Centres and Training Colleges has been carried on with most praiseworthy steadiness, zeal, and ability; that there has been a distinct advance in the quality of the results; and that further improvement is plainly manifest in the general tone and condition of the Training Institutions as a whole. I desire to make special commendatory and appreciative mention of the skill and devotion with which the teaching staffs of the Training Colleges have, amid rather unsettling conditions, continued so earnestly and steadily to discharge their duties, and of the readiness which they have shown to adapt themselves to changing circumstances and to master and utilize new methods.

Further Advance now to be looked for.—At a transition time like this it is not safe, nor would it be wise, to make forecasts. But I cannot help feeling, from all that I have seen of the spirit and the work of the past session, and from what I know as to the aims for next session and the organization made ready for it, that the session 1907–8 will be memorable for the definite beginning in it of a new system destined to effect momentous changes for the better in the training of our teachers and fraught with far-reaching beneficial influence upon the education of our country.

Scheme of the rest of this Report.—Section II. of this report will deal with the University work taken up by our Students in Training; Section III. with all the work of these students, both University and Non-University, which the Training Authorities have to provide for outside of the University classes; Section IV. with the papers of the candidates at the King's Scholarship Examination; Section V. with the papers of the Acting Teachers who sat at the Certificate Examination.

SECTION II.

University Subjects.

Increase of Attendance at University Classes.—The plan, begun 35 years ago, of including attendance at University classes as an integral part of the training course of the more highly qualified students has been consistently followed up to the present time. The number of students in attendance at the University has, from a very modest start, year by year steadily increased; 1,010 out of a total of 2,195 students in training being in attendance at the University this year, as compared with 759 last year out of a total of 1722.

Readjustment of Curricula.—Under the new system, not only has the whole field of training been greatly extended, but, in addition, better provision has been made for adjusting the nature and duration of the training courses to suit the requirements of the various classes of entrant. This closer adaptation to needs has no doubt tended to attract a larger number of candidates.

Rise in Attainments of Students on Admission.—Whatever may be the cause of the advance, it is clear that the average standard of attainment possessed by candidates for admission to training is steadily rising. No change has been made in the qualifications required to secure attendance at University classes. Either the University Preliminary Examination must have been passed or equivalent passes must have been obtained at the Leaving Certificate Examination. That the proportion of University students has risen in one year from 44 to 46 per cent. of the whole number in training is a most welcome proof of the upward movement in this respect.

Training Centres.—At the beginning of the session the Training Centres, previously under the management of the Local Committees, were placed under the control of the Provincial Committees. At all the old centres there has been an increase, and at the new centre established in Edinburgh 103 students were enrolled.

Training Colleges.—Of the 1,010 students in attendance at University classes, 409 were students in training at the eight Training Colleges. This shows a decrease of 20 from the corresponding number of the previous year. As these students

attended the University under the same conditions, and enjoyed the same University privileges as the students enrolled under the Provincial Committees, there seems to be no need for making a review of their University work apart from that of the general body of University students in training.

Necessity for Courses of Study.—The direct object of this combination of University and Training College work has all along been to enable the more highly qualified students to prosecute their studies in certain subjects on a higher plane than was possible at a Training College, and also to afford them an opportunity of acquiring something of that wider culture which has always been associated with the atmosphere of a University. The undoubted success which has attended the introduction of University work into the students' curriculum is a complete justification of the far-sighted policy which initiated this system. Many eminent teachers in the public schools of to-day owe their present position and influence to the stimulus to advanced study which they received from the permission to attend the University during their course of training. Students of ability eagerly seized the opportunity offered, and many who were unable to graduate during their training course nevertheless found ways and means later on to complete the University course and obtain the coveted distinction of a University degree. But while this desire for graduation is a powerful incentive, and as a living force has to be reckoned with and utilized, there is the danger, unless proper safeguards be taken, of its interfering with and partially obscuring the prime purpose of training, namely, the thorough technical and professional equipment of the student for his future work as a teacher. Under existing circumstances instruction in many subjects that are needed for the equipment of the teacher of an elementary school—such, for example, as Drawing, Singing, Hygiene, Physical Drill, &c.—cannot be obtained at a University; and, accordingly, independent provision has to be made by the Training Authorities for the teaching of all such subjects. It is just in order to prevent the University work from dominating a student's course to the detriment of other necessary subjects that Article 24 of the Regulations provides that the instruction and training of students who attend University classes must be arranged on the basis of a well defined three years' curriculum of which the University classes to be taken shall constitute an integral part; and, by Article 18, such courses must receive the approval of the Department.

Little change in these Courses for the past Session.—The courses of study during the past session show little alteration from those which have been followed in recent years. The Provincial Committees have, however, as I have already mentioned, taken the question of curricula for the different classes of students into most careful consideration, and have prepared for adoption in the now current session a series of well-defined courses, which have received the approval of the

Department. As, however, these do not apply to the session here under review, detailed consideration of their constitution and merits is postponed.

Co-operation of University Authorities.—The University training of these students is a question which concerns not only the Training Authorities who are sending them in such large numbers to University classes but also the University Authorities who accept responsibility for this side of the teacher's training. More flexibility in courses to suit the needs of this class of student is desirable; but reform within the Universities hastens slowly. Meanwhile it is gratifying to note that there are distinct indications on the part of the University Authorities of their willingness to co-operate in this work of training. In the summer courses in Botany, Natural History, and Chemistry, in particular, care has been taken to conduct the work on lines admirably suited to the needs of students who are in training to become teachers. Mention may also be made of the recently established courses in Experimental Psychology and other branches of educational study. Additional evidence of this growing co-operation is to be found in the institution of suitable courses in Logic, Ethics, and Psychology, conducted by University lecturers, for the Non-University students at Aberdeen, Dundee, and Glasgow.

University Classes.—The Non-University portion of the curriculum followed by these students will be reviewed in the next section of this report, which deals with those portions of the instruction and training for which direct and separate provision is made by the Training Authorities. Here it is proposed simply to give an estimate of the efficiency and progress secured at the University classes. As I explained in last year's report, the students' marks for this work are, in the first place, assessed by the University professors or lecturers who conduct the respective classes attended. Towards the close of the session a report is received from each professor showing the order of merit and the relative mark of proficiency—based on the class and other examinations which have been held during the session—gained by the students in training who have been in attendance at his particular class. It is gratifying to note that the results for this year compare quite favourably with those of former years. Many of our students in training find their way into the prize and merit lists, and some carry off the highest distinctions.

Education.—The classes in Education are very largely attended, the total number of students at these this year being 334, as compared with 233 last year. More than one-third of the whole acquit themselves "with distinction." At Edinburgh two of the training students were medallists, and fourteen secured a place in the first class of merit. At Aberdeen, six gained prizes and fourteen were placed in the first order of merit. Equally good results are recorded at the other centres.

Psychology and Ethics.—In connexion with the Advanced Class in Psychology and Ethics which is conducted at Aberdeen

in the summer session, Mr. Clarke reports that the class was an excellent one and the work throughout highly satisfactory. Eleven of the fourteen members of the class were graduates whose interest in their main subject was not confined to the bare minimum of undergraduate requirement. Mr. Clarke is of opinion that the further study of Psychology and Ethics in their bearing on Education broadens and strengthens the foundations of theoretical knowledge, and is well calculated to give an impetus to independent thought and research in the student's subsequent career.

Experimental Psychology.—The three students who attended the class in Experimental Psychology at Edinburgh made a fair appearance.

English—The English classes show a large increase in attendance this year, the total number of University Students of this subject being 298, as compared with 188 last year. Of these 14 were in attendance at honours classes. The general results, though slightly lower than last year's, nevertheless indicate a very fair average of attainment. A larger proportion than usual fall into the class marked "fair." Professor Dixon, Glasgow, recommends that, where at all possible, the students in training should, as is advised in the Calendar, take the English Literature class in the third year of their University course, and after they have taken the class of Logic or of Moral Philosophy. Students who enter the English class earlier than this find themselves at considerable disadvantage. It may be noted here that the importance of reserving the University study of English until near the end of the training course is thoroughly recognized by the Training Authorities. In no case, except under very exceptional circumstances, is English taken in the first year of training. At certain centres it appears as, optionally, a second year subject, where no other arrangement is found to be possible; but students are strongly recommended to reserve it for the third year of training. Supervised courses in the reading of selected works of the best English authors invariably precede the study of this subject at a University class.

Latin.—There is an important increase in the number attending the Latin classes this year, the total having risen from 256 to 343. Of these, 5 attended honours classes. There is an appreciable advance in average attainment, the proportion of students gaining good marks being 65 per cent. of the whole as compared with 58 per cent. last year. Comparatively few distinctions, however, were gained at any of the centres. The results at Aberdeen are lower than those at the other centres.

Greek.—Few students in training attend the Greek classes. Of the 23 in attendance this year, 3 took the honours class. The results are rather disappointing, only 8 out of the whole number being credited with a mark above "fair."

French.—The total number in attendance at the French classes was 189, an increase of 41 on the total for last year.

Nine students attended honours classes. The average attainment is not quite so good as it was last year, a somewhat larger proportion of the total number of students failing to gain good marks. Dr. Sarolea (Edinburgh University) desiderates a higher standard of oral proficiency on the part of these students when they join his class. Ninety per cent., he observes, of the King's Students and Scholars are unable to follow his French lectures at the beginning of the session. At Glasgow the highest places in the French class were gained by students in training. Monsieur Martin refers in his report to the very large proportion of students who did not make anything more than a "satisfactory" appearance in his classes. The majority of the weak students were first year students.

German.—The German classes were attended by 63 students, of whom 11 attended the honours classes. This shows a considerable increase as compared with the numbers in attendance for the past few years. The reports indicate highly satisfactory attainments. Three-fourths of the total number of students have gained very creditable marks.

Mathematics.—The classes in Mathematics at the various centres were attended in the aggregate by 366 students in training, as against 279 last year. It is gratifying to note that there is an appreciable improvement in the quality of the average attainments, although too large a proportion of the students still fail to secure a higher mark than "fair." The results this year show that 60 per cent. of the whole number rise above this mark, as compared with 56 per cent. in the preceding year. Aberdeen and St. Andrews show the best results in this respect. Professor Chrystal, Edinburgh, anticipated that with the large increase in attendance this year there would probably be poorer results, but his anticipations fortunately have not been realized. Professor Steggall, Dundee, commenting on the large number of students whose work was relatively inferior, states it as his opinion that many do not derive the full benefit from the work of his class owing to their previous inadequate preparation and their practical ignorance of rudimentary mathematical ideas.

Natural Philosophy.—The classes in Natural Philosophy were attended by 236 students, as against 147 last year. The Professors' reports are generally very satisfactory. About 70 per cent. of the students acquit themselves with credit, and the distinctions gained are fairly numerous.

Moral Philosophy.—The classes in Moral Philosophy have not shared in the increase of attendance which has been so general at other classes. The number in attendance was 95, exactly the same as last year. The results, as a whole, are highly meritorious, 76 per cent. of the total number of students acquitting themselves with credit. Twenty-four have succeeded in gaining distinction in the class merit lists.

Logic.—The number of students who attended the Logic classes was 248 this year, as compared with 246 last year. The

results generally are highly praiseworthy. The proportion of students gaining at least the mark "good" is 69 per cent., which compares quite favourably with the results of previous years. There is a marked improvement in the returns for Edinburgh, where 8 secure places in the first class of merit, and 14 in the second class. As usual, our students at Aberdeen have gained many distinctions.

History.—The results in History show a marked improvement upon those of last year. In this subject 85, in all, attended University classes, as compared with 71 last year. The proportion of the whole gaining the mark "good" has risen from 40 to 61 per cent. In addition to the number in attendance at the ordinary History class, 9 students attended the class in Constitutional History, with very creditable success.

Chemistry.—In Chemistry 50 students attended the Systematic classes, and 46 the Practical classes. The reports show that the work done was generally of high quality, and quite equal to that of former years. Less than 20 per cent. of the total number fall below the mark "good."

Botany.—The number in attendance at the Botany classes (which are held in the summer session) has risen from 44 to 207 this year. The greater portion of this increase is due to the attendance at Glasgow of 135 students, as compared with 10 in the previous year. The general results are thoroughly satisfactory. Professor Trail, Aberdeen, comments most favourably on the regularity of attendance and the diligence of the students. He is of opinion, however, that the pressure of other studies has affected the work of those who are found in the lower grades in his report.

Zoology.—In Zoology, 47 students attended the Practical class, and 52 students the Theoretical class at Aberdeen University during the summer session. The proficiency reached is very favourably commented on. Dundee had 24 Zoological students; St. Andrews, 3; and Edinburgh, 1. The results at these centres are distinctly creditable.

Geology.—Geology was taken by 12 students in all, of whom 11 showed very creditable attainments.

Other Subjects.—A few students attended one or other of the following classes:—Political Economy (5); Agriculture (1); Archæology (2); and Surveying (6).

SECTION III.

Non-University Work.

Non-University Subjects, both Professional and General.—As has been already mentioned, the majority of the students in training are still—though this year in markedly diminished relative proportion—those who do not attend any University classes. For students in training who do attend the University the Training Authorities have to make direct provision of instruction

only in those subjects of the professional training and general equipment of the future teacher for which provision is not made at the University. But in respect of their Non-University students they have not only to provide the instruction in these indispensable subjects, but they have also, through their own resources and organization, to make provision for "the revisal or the development of the student's knowledge of the subjects of general education." It is with this wide range of Non-University subjects, both professional and general, that the present section of my report deals.

Assessments of Students' Marks.—In my report for last year I explained fully the then newly adopted method according to which the attainments of the Student in the various subjects of his curriculum were ascertained, and assessed. The same system has been adopted this year. It has worked with even greater smoothness than last year, and with at least equally satisfactory results.

Reports by Special Examiners.—The following observations on the nature of the provision made for the various subjects of the curriculum and on the quality of the work done in them are based upon the reports furnished by the Special Examiners to whom the duty of inspecting the several branches of the work has been assigned by the Department. In summarizing these careful and valuable reports—as I am unfortunately obliged to do, from considerations of space—I shall do my best to preserve their essential features and to omit none of the helpful suggestions which so many of them contain.

General Level of Efficiency very Satisfactory.—From the perusal of these reports, as well as from my own observations made on the occasion of my visits to the various Training Centres, I am glad to be able to state that the general level of efficiency of the work in connexion with the training of teachers has never, in my experience, been higher than it has been during the past session.

Theory of Education and Practical Training.

Theory and Practice of Education.—As in former years, the Theory and Practice of Education come more particularly under my own observation. The favourable opinions which I have had the pleasure of expressing in previous reports upon the attention paid to this part of the training work and upon the efficiency with which it is carried out have been strengthened by further experience and more extended observation of it this year. I have found the lecturers on theory, and the masters and mistresses of practical method one and all actuated by a just sense of the vital importance of this side of the training work, and keenly alive to the responsibility which rests upon them as trainers of the future teacher. Not a few of them, besides, bring to their work a living personal enthusiasm that awakens a responsive spirit in their students.

It is gratifying to note encouraging signs of increased interest in Child-study, and also of earnest desire to keep abreast of recent developments in method. But the feeling that changes in organization were imminent has prevented any decided departures in the way of new experimental work. Greater thoroughness and improved efficiency along the old lines are the main characteristics of this year's work.

Theory of Education.—The study of the Theory of Education has in general been pursued on the lines of previous years. As a rule, the giving of the instruction in this subject has devolved upon the Principal of the Training College or Centre. In three instances, however, the work was taken, wholly or in part, by a Master (or Mistress) of Method.

At several centres practical work has been more or less systematically carried on in Experimental Psychology, interest in this subject having been greatly stimulated by the more important place which has recently been given to the study of School and Personal Hygiene.

Specialization in the Teaching, with the aid of the Universities.—There are noteworthy indications that it is beginning to be better realized that Education as a branch of the curriculum covers a wide field within which there is a good deal of room for specialization. In the arrangements for next session provision is being made for the giving by specialists of separate courses in Logic, Psychology and Ethics, Experimental Psychology, and the History of Education. In most cases the specialists who take this work will be University Lecturers or Assistants. Both the specialization in these subjects and the co-operation of the Universities are to be heartily welcomed; but care may have to be taken that in these courses the subjects are treated not so much from the traditional academic point of view as with the aim of making them really helpful to the future school-teacher.

Training in Practical Method.—The practical application of the theoretical principles of Education to the teaching of the various subjects in the school curriculum forms the special branch of professional training placed in the hands of the Masters (or Mistresses) of Method. At all the Training Centres the work in this branch is carried out with much care and with, on the whole, very satisfactory efficiency. While, as a rule, each centre shows some individual and distinctive feature in the methods which it adopts, yet there is in the main similarity of procedure in this work at all the centres. Methods are discussed with and by the students; demonstration or model lessons are taught by experts; criticism lessons are taught and criticized by the students, under the guidance of members of the training staff; and provision is made for securing adequate and duly supervised additional practice in teaching. It is a recognized rule at all the centres that the lecturers in the other branches of the curriculum take part in this training, in so far as it deals with the teaching of

their several subjects. Much mutual benefit is admittedly derived from this collaboration. There is, however, room for further and more systematic development of this practice.

Criticism Lessons.—At all the centres the traditional Criticism Lesson continues to be an important factor of the training in method. Judiciously used and properly co-ordinated with the other means at the disposal of the instructors, it is undoubtedly of high value in the training course, and no one would lightly discard it. But to be used to the best advantage and to be made a really effective instrument of training, it must be carefully supervised and regulated. As still sometimes conducted, it is open to the grave objections,—that it is taught under conditions that are abnormal for both teacher and scholars; that it therefore has about it more or less of artificiality; that it does not fit in naturally and properly to the stage of knowledge and advancement of the pupils to whom it is given; and that, consequently, instead of being a lesson properly so called, it is too often but a sort of exhibition-revisal of former and already well-known work.

Utilization of the Public Schools.—The now wider and more systematic utilization of the public schools for the purposes of the practical training of our students will do much to obviate most of these disadvantages. The additional practice obtained there, with normal classes under normal conditions, and with only the class teacher, and, occasionally, a master of method present, will give ample opportunity for calling forth, testing, and developing disciplinary power; and, from the conditions of the case, this teaching-practice must follow the lines of the ordinary class-work according to the school time-table.

Both methods are needed. The college criticism lesson puts into concrete form the conceptions which the student has derived from the theoretical lectures and discussions on principles and methods, and gives him an opportunity of improving any skill in the handling of classes which he has gained from his previous experience. Further, it provides opportunity for noting and estimating teaching-results, for drawing attention to mistakes in method, and generally for stimulating in the students an observant and reflective attitude of mind with regard to both the processes and the effects of right—or, it may be, of wrong—teaching. Then in most valuable, indeed necessary, supplement to this, the additional practice carried on in the ordinary school helps to develop and increase the student's skill in the management of large classes and in the proper handling and presentation of subjects, and affords to him further opportunities of testing and correcting ideas gathered merely from his theoretical study, whilst it also tends to make permanent his acquisition of approved methods of teaching.

Demonstration Schools needed.—For the purpose of demonstration and criticism lessons a *Demonstration* (or, to use the old term, a "*Practising*") school specially attached to the

Training Centre is a most desirable, indeed, an indispensable adjunct to a properly equipped centre. This school need not be large. It should, however, be really a "model" school—a model in respect of organization, furnishing, and equipment, as well as in respect of methods of teaching. Students should be able to see there the most approved methods put into systematic practice under the best conditions. There is still room for considerable development and reform before it can be reported that this ideal is being satisfactorily realized. In such a school all that is best and most up-to-date in equipment for school work should be found in use. The Training Demonstration School should eventually have its special separate rooms for the teaching of Geography, History, Languages, Science, etc., each completely equipped with all the most suitable aids to the proper study of its particular subject. It should also be a model school in all hygienic respects.

In order to attain a thoroughly satisfactory solution of the various problems as to organization, staffing, curricula, etc., that are incident to the new conditions under the Provincial Committees several difficulties have yet to be overcome. I am glad to report that these are being tackled with resolution and wisdom.

The very large numbers that have to be dealt with now at some of the centres constitute a special difficulty. Everywhere there is manifest the desire to make the Practical Training of the students as effective as possible; but where the numbers are very large there is a tendency to make the class-groups of the students unduly big, to the marring of the thoroughness and efficiency of the discussion, criticism, and observation branches of this work. Special attention has been called to this point wherever necessary; and in all these cases arrangements either have already been made, or are in progress, for the needed increase of the staff for Practical Training.

English, History, and Latin.

English.—The prime importance of the study of English as an essential part of the curriculum is duly recognized at all the Training Centres. From the reports by H.M. Inspector Mr. Smith, (who has succeeded Dr. Dunn as Special Examiner in English) I am glad to find that in this subject the progress noted in previous years has been very creditably maintained. The programmes of instruction at the various centres have been most assiduously and intelligently carried out. But some of these programmes are yet, as might be expected, open to revision and improvement. In several instances there was found a tendency to over-emphasize exegesis. Occasionally the books selected for reading included a few that could not be considered as belonging to the main current of English Literature. At one college the teaching was in too many hands, with the result that there was too much diversity of aim and method: at another it was in the hands of only one lecturer, where the

amount of work to be overtaken plainly called for additional assistance.

History.—The work done in History at most of the Colleges is the subject of favourable comment.

Latin.—Elementary Latin is taught in the Training Colleges generally on sound lines, and with special consideration of the bearing of the study of this subject on the study of English.

The General Level of the Work in English.—In addition to his special reports on the several centres, Mr. Smith has furnished an able and interesting general report which, while describing the condition and quality of the instruction as a whole, contains many wise and stimulating suggestions. In this report he states that at first he expected to find the work done at the Training Centres more or less on the University level, but that this expectation was not realized. In only one college could it be said without reservation that the work in English was on the University level; and even there signs were not lacking that the ideal had been pitched too high for some of the students. As to this Mr. Smith remarks :—

"This statement does not necessarily imply any disparagement of the work elsewhere attempted in Literature. If the students are not fit for University work it would be foolish to attempt University work with them. But the fact that in one, at least, of the colleges work on that plane is attempted with considerable success suggests the question whether the lower aim with which the other lecturers are content is altogether imposed on them by the inferiority of their material, or is in part a survival of a standard and a method inherited from the days of Certificate Examinations."

The question here raised is worthy of serious consideration, and it will no doubt command the thoughtful attention of those who have charge of the English studies at the Training Centres. Emancipation from bonds which for so many years restricted the main stream of effort to the narrow channel of preparation for set examinations is being realized but slowly. Yet genuine progress in this direction has been made in recent years. Curricula have been widened, and a freer spirit has been infused into the study.

English Literature.—In a very thoughtful excursus on the English curriculum best fitted to turn students into effective teachers, Mr. Smith places English Literature first in the rank of culture-subjects. His chief objection to the current methods of instruction is that they do not cling fast to this point of view, but regard Literature as a mere object of literary interest, or even simply as a department of scholarship. The former of these incomplete conceptions leads to discursiveness, to undue attention to minor figures, and to an over-fondness for Literary History; the latter is apt to lose sight of the larger issues and to "burrow in a warren of exegesis and textual comment." Mr. Smith's practical suggestions may be best given in his own words :—

The Selection of Books to be read.—"The books selected for reading should be chosen first of all for their *matter*, for their power of stimulating thought and widening the intellectual horizon. If the teachers are still

young enough to remember what books so influenced themselves, they can do no better than choose and expatiate on these.

"But form is important too. The study of Poetics and of Rhetoric—of the arts by which the poet and the orator produce their effects—is itself no inconsiderable part of culture, and has a strong attraction for the scholastic mind. But this study should be pursued not along the high *a priori* road but by the patient and minute analysis of a few masterpieces.

"Furthermore, Literature is not a mere intellectual instrument. As such, it is inferior to Philosophy. But it can do something that Philosophy cannot—it can appeal to the emotions and the sentiments. And recalling what was said of the stunting effects of the pupil-teacher curriculum, I am disposed to rate this function of Literature very high.

"Fortunately, all these aims—the cultivation of intelligence, of judgment, and of feeling—can be achieved by keeping in the main current of English letters. We should not waste time on trivial moderns."

English Language.—The subject of English as a language is represented on the official syllabus by (*a*) Phonetics, (*b*) Elementary Latin. Phonetics will be considered separately in a later part of this report. Meanwhile it seems desirable to give expression to Mr. Smith's views on its place in the English curriculum. Mr. Smith points out that a considerable extension has been given to the original conception of this subject, with the result that the course in it has now in most places developed into a fairly full treatment of Linguistics. He calls attention to the possible danger of this study's thriving at the expense of English Literature and eating its way into the time hitherto devoted to the latter subject, and pleads that every possible care should be taken to obviate such a result. The full study of Linguistics is, in his opinion, more for those students who are seeking to specialize than for those ordinary students who are merely seeking to qualify themselves for the General Certificate. Were Linguistics recognized as a University subject, it could be left to hold its own there against other University subjects. For Non-University students Linguistics should be regarded strictly as a professional subject, to be pursued simply as far as may be necessary to make them efficient teachers of English in the elementary school.

Elementary Latin as a part of the English Course.—Regarding the propriety of including Elementary Latin in the English course Mr. Smith remarks :—

"On the one hand, Latin holds quite a unique position as a source of English vocabulary ; on the other, I have observed that even a slight knowledge of Latin as a real language—a language in which sense could be written—created an interest in English vocabulary that was never produced by the study of isolated roots. Moreover the influence of Latin on English syntax has at various times been considerable."

History.—In the two short courses on History given in the summer sessions there are generally two objects in view. In the first place an attempt is made to expand the student's horizon, hitherto limited to British History, so as to embrace the greater movements of European History ; and in the second place, British institutions are passed under review, and a sketch is given of Constitutional History. The length to which these lines of study can be followed is determined by the time available and by the initial attainments of the students. Yet, circumscribed

as it must be, the study of History as at present pursued has a real value, especially when it is enriched, as is generally the case, by collateral study of great writers like Burke or Gibbon. The least satisfactory work was found at one centre where the subject was treated merely on the lines traditional in secondary schools.

Mathematics.

Mathematics.—The study of Mathematics is conducted on very intelligent lines at the various centres. Steady progress is the chief note of the past session's work. The following report by Messrs Philip and Fraser, the Special Examiners in the subject, indicates the advance which is being made in organization and attainment:—

"During the past session classes in Mathematics have been held at Dundee for the first time, under the charge of Mr. Norrie, the University Lecturer on this subject. The original syllabus of instruction was considerably modified, and at one visit of inspection during the latter period of the session the work appeared to be conducted with real benefit to the students. The lecturer has taken the utmost pains to make his teaching effective, and an examination of the ground actually covered showed that his efforts had met with success.

"At the other centres (the same as formerly) the work was found at our visits to be proceeding very satisfactorily according to approved syllabuses of past sessions. Each college has developed a course more or less distinct from the others, but the same spirit pervades the instruction throughout. The aim is well defined, and both lecturers and students are interested in this subject. It has already been noted that the sub-division of the classes at the larger centres has had the effect of bringing teacher and student into closer touch, with excellent results. While the subject has a natural development of its own, its connexion with other subjects of the curriculum has been duly appreciated."

Science and Geography.

Science—Distinct Progress.—From the report furnished by H.M. Inspector Mr. F. W. Young on Science and Geography it is gratifying to find that in these subjects there has been distinct further progress during the past session. Students are now entering the training institutions with a more advanced knowledge of Experimental Science than formerly, and the schemes of instruction have had to undergo modification to suit the new starting point. More advanced work is now possible, and the Centres have been quick to respond to the fresh demands involved in the extension of the study. To assist in this forward movement, Mr. Young indicates in a series of suggestions the lines along which the study might be most profitably developed.

Suggestions for further Development.—These suggestions have already been communicated to the several Training Authorities. With the general lines of Mr. Young's proposals I am entirely in agreement; they indicate in my opinion, the kind and course of Science work which undoubtedly are the most useful for our students in training.

Laboratories.—The laboratories, many of which are either new or have been improved within recent years, are generally well adapted for their purpose. At the Glasgow Roman Catholic College a splendid laboratory has been fitted up within the handsome new buildings just completed there. Bright, spacious, and exceedingly well appointed, it takes its rank among the best laboratories in the country. In it admirable facilities are provided for the prosecution of Nature Study in all its branches.

H.M. Inspector Mr. Young's Report.—I have pleasure in giving here Mr. Young's report, which presents a graphic yet succinct review of the year's work:—

"The Science work in the different Training Colleges has undergone during the past session further modification and extension in order to meet the requirements of students coming up from schools and pupil-teachers' institutes with a wider experience of Experimental Science work than formerly. As a rule more advanced courses of study have been provided. These have varied in character according to the predilections of the instructors, who have had every encouragement given them to develop their work along the lines considered by themselves most suitable in the circumstances. Useful and varied experience has in this way been gained.

"In some of the Colleges the phenomena of Light have been experimentally studied—shadows and eclipses, reflection from plane surfaces and curved mirrors, common cases of refraction, lenses and spectacle glasses, the simple telescope, the optical lantern, the photographic camera (with a lesson or two on photography), the eye as a camera, etc. All this has been thoroughly well done, and the work has been highly valued by the students.

"In last year's report it was urged that, instead of pursuing a continued course of instruction in any particular Science, the work should rather at this stage follow more and more the lines of Nature Study methods applicable in the Elementary School, so that the skill and knowledge of Experimental Science already acquired by the students should be applied to the physical and chemical investigation of various common and naturally occurring substances and phenomena. Studies based upon this suggestion have already been entered upon, and wherever this has been the case the work has been attended with a large measure of success. Among the various subjects taken up may be mentioned (*a*) sea-water; (*b*) starch and sugar, with some of their derivatives; (*c*) forms of calcium carbonate found in nature; and (*d*) coal, in its many varieties.

"The students selected for the work were allowed a fair measure of latitude in their operations, it being stipulated that a faithful record should be made and kept of every part of the students' own experiments, observations, and findings. These note-books, neatly written and illustrated, have proved in several cases most encouraging reading. In conversation with the students one could not fail to be impressed by the large amount of interest which has been aroused and maintained. The new work has been entered upon with great zest and spirit, as a rule; and there is good reason to believe that its continuance is now assured.

"The Botanical and Zoological studies have not undergone any development worthy of special mention. Few of the students hitherto have come up to the Colleges with any previous knowledge of these subjects, and so progressive changes in the study of them have not yet become essential, as in the case of the physical and chemical studies. The courses of study mapped out for previous sessions have been followed generally, but a perusal of these, or even of the students' note-books—good in many cases as they are—would fail to give anyone an adequate estimate of the value of the work done in these classes. The instructors are highly skilled and enthusiastic naturalists, and the expert guidance given to the students both in the laboratory and in the field is, in consequence, of a very satisfactory nature. The lessons and excursions have been excellent illustrations of the method of Nature Study, and they will doubtless be recalled by the

students with satisfaction; but the small amount of time given to the work in the course of two short summer sessions has proved quite insufficient for more than a bare introduction to the study of living things.

In the changes that are being made in the curricula of the Colleges, an amplification of the botanical and zoological work is essential if Nature Study is to take a worthy place in the Elementary School.

Geography.—The instruction in Geography is now of a very practical type. The time which can be spared for this subject is perhaps not all that could be desired, but the course universally followed is on lines which cannot but be of great permanent value to the students. Concerning the nature of the work done, Mr. Young remarks:—

"Beginning with a simple survey of some small part of the surrounding district in which the plane table, the sight compass, some simple form of theodolite, the clinometer, etc., are all brought into actual use by the students themselves, a plan of the surveyed district is made, and the students are given in a thoroughly practical way to understand the principles of map-making, and incidentally to learn something of land measuring, the determination of amount of slope on a hill side, the making and use of contour lines, etc.

Careful survey map reading is made a feature of every class, and the general physiographic features of the district are, as a rule, carefully studied Good relief maps have been constructed in a few of the classes.

"Some simple astronomical geography is usually introduced into the course, as well as the study of weather charts and the factors which determine climate."

French.

Modifications in the Study of French at the Training Centres now probable.—The operation of the New Regulations will necessarily produce changes of organization in the study of French at the Training Centres. Under the new schemes of study which have been proposed for the current session the extent to which French, which has been made a strictly optional subject, may be taken, has every prospect of being modified.

Progress during the Past Session.—During the past session, however, it has been taken by the same classes of students, and under the same organization as formerly. Monsieur Martin, the Special Examiner, comments most favourably on the progress which has been made. The quality of the work has been appreciably raised. The classes are not too large, and they have been well graded. Class teaching is supplemented by tutorial work under *répétiteurs* or *répétitrices*. This combination has contributed much to the uniformly good results which have been attained at the various centres, especially in oral work. Concerning the recent improvements in methods, Monsieur Martin reports:—

"Antiquated and wearisome forms of teaching have practically been abandoned, and if one looks over the syllabuses of work one easily realises, in some measure at least, the extent of the existing improvement. The greater part of the time in class is occupied by the critical reading and study of carefully selected French texts, by oral composition in French, and the correction of exercises in free composition. Such teaching is highly appropriate in the case of students in training. It is stimulating and inspiring in the same measure as it is exacting."

German.

Tendency to relegate German to the University.—As in the case of French, the whole tendency of the new Regulations is to encourage the study of German at University classes rather than at specially provided classes at a Training Centre. So far as German is still retained at several centres among the optional subjects, one of which may be selected by students even though they are not in attendance at a University, separate provision will doubtless be made for its teaching by the Training Authorities, but it is not anticipated that the demand for it by this class of students will be very large. During the past session the arrangements for instruction in it were allowed to continue as in previous years. Classes in German were accordingly taught at four of the Training Colleges. Concerning the quality of the work Dr. Schlapp, the Special Examiner, reports:—

"*Work at four of the Training Colleges during the past Session.*—No material change has taken place during the last year in the teaching of German in the Colleges. The number of students is steadily diminishing. There is noticeable in all the colleges a continued progress in distinct articulation and correctness of pronunciation. Promising attempts are being made—especially in the Church of Scotland College, Glasgow—at intelligent and expressive reading aloud of prose and verse. Class libraries have been formed at all the colleges, and are taken advantage of. Free composition forms everywhere an important part of the work. The study of colloquial idioms and the practice of oral composition and conversation are not neglected. In the oral examination candidates showed, on the whole, commendable readiness and fluency in the use of simple German. The papers of some of those who failed in the written examination were very disappointing. In many of these cases there was evidence of gross ignorance of the elements, of a want of familiarity with poetic diction and poetic thought, and also of a want of practice in simple German prose writing."

Phonetics.

Developments in the Study of Phonetics during the past Session.—The arrangements during the past session for the study of Phonetics have been beneficially modified at several of the centres and show on the part of the various training authorities an increasing appreciation of the value of the subject as a necessary element in the equipment of a teacher. In several cases, where formerly too little time was set apart for this study, the course has been very profitably extended. For the first time, since this subject became an integral part of the teacher's curriculum, has it now been adequately provided for at all the centres. There has been also a gratifying rise in efficiency all over, and particularly at the Edinburgh Church of Scotland Training College, the Glasgow Church of Scotland College, the Glasgow Roman Catholic College, the Glasgow King's Students Centre, and the Aberdeen King's Students Centre. There is still difference of opinion as to the extent to which the study may be most profitably prosecuted, but there is common agreement that the student-teacher should possess a thorough grasp of practical Phonetics, so that he may be able to deal scientifically and effectively with the ordinary defects of pronunciation to be

met with in the public school. Such practical knowledge can be acquired only through much individual practice under expert guidance. To secure the best results it is of the utmost importance that the students engaged in this practice should be taught in classes of a reasonably small size. During the past session subdivision of the students into groups for practical work has been more or less systematically carried out at most centres of training, and there is good reason to expect that the progress noted this year will not only be maintained but even be increased under the new conditions. The following extract from the report of Professor Wyld, the special Examiner in this subject, shows the nature and extent of the advance made this year:

"It affords me great satisfaction to be able to inform Your Lordships that the general standard of attainment in Phonetics is distinctly higher this year than it has been before. A better series of results has been obtained throughout all the centres, and everywhere almost there are signs that the purpose and possibilities of Phonetic study are being better grasped, and that the application of this method to the practical and historical study of the native tongue is in a fair way to be intelligently developed. I could wish that the application of Phonetics to the study of Modern Foreign Tongues were more thorough-going and systematic in some centres, but I am in hopes that this, too, may come in time."

Drawing and Manual Instruction.

Drawing.—The report on Drawing, by H.M. Inspector Mr. Ewen, is again a record of steady progress. The importance of Drawing, both from the professional and from the æsthetic point of view, is being more thoroughly appreciated at all the centres. It is, however, to be regretted that several of the Art rooms are still poorly equipped and badly lit. These defects will no doubt be remedied by the Provincial Committees at an early date.

I desire to emphasize Mr. Ewen's appeal that every care should be taken to have the Drawing course in the Demonstration Schools carried on under the most favourable conditions and on the most approved lines. Mr. Ewen's remarks upon the modifications of the course in Drawing which are called for under the new conditions are also worthy of very special attention.

It is specially pleasing to note the enthusiasm shown and the progress made by the students admitted, under Art. 73 (*C*) of the Regulations, for a single year's training.

Visits by the students to art galleries and museums, so strongly advocated by Mr. Ewen from the point of view of their effect in cultivating the artistic feeling, are deserving of every encouragement.

Manual Training.—Manual training is carried on with marked success at several of the centres. This whole subject, however, is capable of considerable development.

I append almost *in extenso* Mr. Ewen's full and suggestive report:—

"*Progress in Drawing.*—Progress in the teaching of Drawing and allied subjects in the various Scottish Training Centres has been well maintained during the past session. The importance of Drawing for the student in

training, not only on account of its place in the ordinary school curriculum, but also as a culture-subject of the most valuable kind, has been generally recognised by the Training College authorities, and due provision has accordingly been made for the adequate teaching and development of Drawing in the various Training College syllabuses. The great progress made during the past few years, and the standard of attainment which the subject has now reached in the Colleges, afford abundant evidence that the opportunities provided have been well taken advantage of by the Art staffs of the different institutions.

"Both the professional and the æsthetic sides of the subject have, as far as circumstances permitted, been well provided for in the past by the Training College Committees, and doubtless the new Training Authorities will see to it that there is no falling back under their régime. Indeed, the present conditions are more favourable to development than the former ones, and many of the disabilities previously existing can now be entirely removed. Under the new arrangements the necessity for teaching Drawing in unsuitable Art-rooms, poorly equipped and badly lit, need no longer exist. Again, where the Training Centres have Practising Schools attached to them, steps should be taken to ensure that the Drawing instruction is in every case carried on under favourable conditions and on thoroughly sound lines, so that the students may have opportunities of seeing Drawing taught as it should be, and of practising the actual teaching of the subject under really satisfactory conditions.

"*Prospect of modification of course, under the new Regulations.*—As soon as the new Training Regulations have attained their normal working conditions, and students come up to the Training Centres with a sound course of training in Drawing extending in many (or most) cases, over five years beyond the qualifying stage, the need for so full a course at the Training Centres will not be so insistent, and the College Art-masters will be able to concentrate more upon the æsthetic and pedagogic sides of the work than was possible in the past, when executive skill and experience on the part of the students were so often sadly wanting. As yet, however, this desirable condition of affairs has hardly been reached, and until the Junior Student Centres are thoroughly equipped and staffed for this part of their work, and junior students come up to the Training Centres with reasonable attainments in Drawing, the Provincial Committees will have to make fairly full provision for Drawing instruction, if their students are to maintain the standard which has been set by the Training Colleges in this important subject. It need hardly be added, however, that the matter is not entirely one of time; and, while a reasonably high standard of attainment is eminently desirable, once this has been secured and the culture-side of the subject has received reasonable attention, further study need not be made obligatory.

"*One Year Students.*—A particularly interesting feature of the new régime this year has been the introduction into several of the Training Centres of a number of acting teachers who came up for one year's training under Art. 73 (*c*) of the Regulations. In the majority of cases the attainments in Drawing of these students were not very high, but almost without exception they took up the work with the greatest enthusiasm, and made marked progress throughout the session, both in executive skill and in understanding of methods and principles. The value of this year of training to these students can hardly be over-estimated.

"*Teaching Staffs.*—Drawing instruction in the Training Centres is in the hands of able and enthusiastic teachers, well qualified in the various branches of the subject, and fully alive to its development. While in every case the fundamental and essential parts of the subject are well emphasized and a sound training secured, there is not even the suggestion of stereotyping or any undesirable uniformity in the methods by which the work is carried out in the various centres. The necessity for the correlation of Drawing with other subjects of the Primary School curriculum, such as Nature Study, Manual occupations, Sewing, etc., is fully recognised.

"*Art-Masters' Visits of Observation.*—The desirability of the various Training Centre Art-masters visiting the Art Departments in other

Training Centres for the purpose of seeing the work done there and of discussing principles, methods, and possible developments, has already been called attention to in former reports. Several useful visits of this kind have been made during the past session, and arrangements should be come to for securing their continuance.

"*Visits to Art Galleries.*—Arrangements should also be made for continued visits being paid by the students to art galleries and museums for the study and criticism of pictures and other works of Art, under the guidance of the Art-master. Such visits should constitute an important feature in the artistic training of the students, and would be of lasting benefit to them as future teachers.

"*Manual Work.*—The development of manual work at the various Training Centres where provision has been made for carrying it on is being well attended to, and the session's work gives evidence of considerable progress. In the case of men students the bulk of the time, as a rule, is very properly given to instruction in Woodwork; but in most instances other materials also receive their share of attention, and the value of the instruction is increased accordingly.

"Schemes of Manual occupations for women students have also been instituted in several of the Colleges, and are working very satisfactorily. Cardboard Modelling, including Drawing to Scale and Development of Solids; Stencilling and Embroidery, both from original designs planned in the Art room; and Clay Modelling, carried on as an integral part of the Drawing instruction, have been the principal occupations taken up in this connection.

Physical Training.

Physical Training.—While the Physical Training at the various centres has been somewhat uneventfully conducted during the past session on lines similar to those of former years, the subject has been receiving the serious consideration of the Provincial Committees. Important changes are in contemplation, which will necessitate an almost complete reorganization of the present system. Underlying these changes is a conviction of the soundness of the conception that Physical Training is but a part of the larger study of the Personal Hygiene of School Life, and that the closer the connection which can be maintained between the various parts of this study, the better will be the results. Captain Foster, the Inspector of Physical Training for Scotland, in a most careful and interesting report details the steps which have been taken by the Training Authorities to co-ordinate the inter-dependent parts of this larger subject so that the students may reap the greatest possible benefit from them. In company with Dr. Leslie Mackenzie, the Department's Special Examiner in Hygiene, he has been consulted by the Committees with reference to future arrangements. With the view of giving all the help they could, these experts prepared a most interesting and suggestive Memorandum on "Systems of Physical Training and their relations to the Personal Hygiene of School Life." This Memorandum was communicated to the Committees towards the end of last session. In this Memorandum the existing systems of Physical Training are passed under review and their relative applicability to the training of the young is discussed. In the more recent systems, which have been formulated on physiological principles, growth is made the cardinal conception; and the exercises are designed to suit children at

different ages and different stages of development. Fitness for the prescribed exercises, moreover, requires to be ascertained. This is a first condition so that the exercises may be judiciously adapted not only to foster normal development but also to secure improvement of defects. Medical supervision is therefore necessary as a preliminary to any prescription of physical training. The importance of viewing education on both its mental and its physical sides as essentially one process can scarcely be over-estimated. From such considerations the nature of the training most suitable for teachers is evolved, and it is shown how necessary it is to secure instructors of the proper type—instructors who have been trained in the general physiology of nutrition and growth, in the physiology of bodily exercise, and in the recognition and management of defects and diseases. This leads to the conclusion that at every centre for the Training of Teachers a special expert Medical Officer should be in charge of the whole department of Hygiene and Physical Training, and that under his supervision specially trained instructors should conduct the practical exercises. The Committees at Edinburgh and Glasgow are to give effect to these recommendations in their arrangements for the forthcoming session. At these centres an agreement with the School Boards has been made, by which the chief Physical Training instructor under the Provincial Committee will also be employed by the School Board to supervise this training in the schools and to direct the instruction of the Junior Students. This co-ordination will be mutually beneficial. A syllabus of work is to be prepared to cover five years of training for our future teachers, comprising a three years' course as Junior Students and a two years' course as Senior Students. The Aberdeen Provincial Committee have a similar scheme under consideration.

Work of the Past Session.—With reference to the work of the past session Captain Foster has several criticisms and suggestions to make. Concerning the time devoted to the subject at the different Centres, he reports:—

Time-table Arrangements.—"During the past year some students received two hours' instruction per week both winter and summer. Other students received one hour's instruction per week, winter and summer; while certain students received only one hour's instruction during the winter session and no instruction at all during the summer session. In such cases the lectures on Laws of Health, School and Personal Hygiene, and Child-study commenced when the Physical Training ceased. This arrangement is unsatisfactory if there is to be a close connection between the two subjects. The total cessation of Physical Training and of practice in the teaching of the subject during part of the year has many disadvantages. Though the time might have to be considerably curtailed during part of the year, the work should be continuous."

This criticism will no doubt receive due attention from the Committees in their schemes of reorganization.

Size of Classes.—In some cases it is necessary that care should be taken to reduce the size of the classes. At one training College the women's classes contained between seventy and eighty students.

Gymnastic Costume.—On the subject of gymnastic dress Captain Foster reports:—

"There has been no difficulty in getting the greater number of women students to provide themselves with suitable costumes and shoes. At the United Free Church Training College, Edinburgh, the female students do not wear costumes. This probably is owing to the lack of suitable accommodation for changing-rooms at the college.

"So far the men have not adopted any simple gymnastic dress. Some have provided themselves with jerseys and gymnastic shoes, but many still wear their ordinary clothing, and do not remove their coats, braces, or collars."

Accommodation.—The accommodation for Physical Training has been improved at several of the Centres. The United Free Church Training College, Edinburgh, is the most handicapped by want of suitable accommodation. The shed, under part of the College buildings, where the work is carried out is entirely unsuited for the purpose, and is wretchedly cold and depressing in winter. The University students under the Edinburgh Provincial Committee had the use of George Watson's Boys' College Gymnasium for the men, and of the Ladies' College Drill Hall for the women. At Glasgow the students under the Provincial Committee were allowed the use of the University Gymnasium. Here several desirable improvements are in contemplation.

Keeping of Records.—With regard to future arrangements, Captain Foster emphasises the importance of the keeping of a careful Record of Work at all Training Centres, and recommends that the students should likewise be required to keep individual records, which should be open to inspection. He is also of opinion that the arrangements for the teaching practice in Physical Exercises require reconsideration and improvement.

Hygiene.

Hygiene.—Dr. Leslie Mackenzie has again furnished most interesting reports on the teaching of Hygiene in the various Colleges. From a perusal of these reports it is pleasing to note that the progress referred to last year, particularly in the development of the practical side of the study, is still continued and is even in some respects more advanced. The clinical work is becoming more and more predominant, and there are now comparatively few centres where the theoretical expositions are not systematically concretely illustrated. At one centre, where the methods employed by the lecturer rank among the most intelligent, Dr. Mackenzie remarks that at every meeting of the Hygiene Class, whether for lecture or demonstration, provision was made for suitable concrete illustration of the subjects under discussion by the attendance of selected children from the Practising School or from other neighbouring schools. The Colleges most conspicuous for the thoroughness with which this practical side of the study is pursued are the Church of Scotland Training Colleges in Edinburgh and Glasgow, and the United Free Church Training College, Glasgow. Dundee Centre ranks

next. At the other centres, much of the work was very good, though not so well developed on this practical side as it might be. It is anticipated that the new arrangements made for the current session by the Provincial Committees in connexion with their scheme of placing both Hygiene and Physical Training under the control of a special expert Medical Officer, will do much to accelerate developments in these centres along the lines which are so keenly desired. In his reports Dr. Mackenzie describes several fresh and interesting developments in methods which have come under his notice. In illustration of the nature of the work done in these classes I give the following extracts :—

Physical Training "Model Course."—"A new feature of the course this year was the employment of a boy to show all the movements of the 'Model Course'—the muscles involved, and the possible deformities resulting from improperly conducted exercises. The boy was stripped so far as necessary and the students were requested themselves to perform the exercises, instructing the boy also in their performance. The exact muscular movements involved were thus shown at close quarters and every student had an opportunity of examining them."

Reaction Experiments.—"Experiments are being prepared at this College on re-action times and fatigue. Some interesting observations have already been made, and shortly the whole subject of reaction time and fatigue will become an easily taught portion of the course. The simple piece of mechanism devised for recording reaction times is perfectly adequate for its purpose, and will undoubtedly give interesting results."

Type of Examination in Clinical Work.—"A type of the clinical examination is the following :—Two groups of pupils were chosen from the Practising School. The first group consisted of six children, three boys and three girls. They were all good pupils, two of them being particularly bright. The second group consisted also of three boys and three girls. But all these were intellectually on a somewhat lower level. The different groups were put through various tests by the Master of Method, who knew the intellectual capacity of every pupil. These tests were designed to bring out differences in alertness, intelligence, etc. The students recorded their views and observations. The records show both keenness of interest and good observation. At the same examination some fifteen more children suffering from different defects or diseases were exhibited to the students, and subjected to various tests. The directions to the students were as follows :—'*Examination*—The pupils gathered together for observation are drawn from the Infant and Junior Classes of the Practising School. Scrutinise them carefully, and record your observations on the sheet with which you are provided. Your observations should not be confined to the more obvious physical peculiarities to be noted. Any conclusions you can draw from what you observe, say, for instance, as to the child's apparent aptitude or the opposite, should be recorded. These will be compared with the reports of the teachers and the results will be discussed later on.'

"The recorded results form a strong justification of this method of teaching. The children chosen were such as any teacher is certain to encounter in any city school. The leading peculiarities were :—rickets, four cases ; squint, three cases ; weak eyes and malnutrition, one case ; short sight, one case ; adenoids, one case ; dry hair, prominent eyes and defects of vision, one case ; mental deficiency, one case ; retarded development, one case ; recent ring-worm, one case ; spring eruption, one case. The students vary in the fulness of the accounts given ; but they all show good observation and judgment. The cases were afterwards commented upon by the lecturer in a subsequent exposition and the leading points enforced. These exercises provide the students with first-hand clinical material, which enables them to verify their previously acquired knowledge and forms an inductive basis for future discussions."

Music.

Music.—From the reports of Dr. Somervell, the Inspector of Singing, on the teaching of Music in the various Colleges and Centres, I am glad to observe that the attainments in this branch of the training show continued progress. There are, as is naturally to be expected, varying degrees of merit among the respective Centres. The highest standard of quality in individual proficiency as well as in the choral singing is found in the Roman Catholic Training College, Glasgow, and the Church of Scotland Training College, Edinburgh. Of the latter, Dr. Somervell says that it would be difficult to speak warmly enough of the way in which the students of this College are trained. The individual work was extraordinarily good, and the choral singing exhibited the usual characteristics of enthusiasm, fine tone, and light and shade. Concerning the former College he remarks that the choral singing was quite beautiful, the singing of two unaccompanied motets calling for special commendation. The students at the St. Andrews, Edinburgh, and Glasgow Training Centres do not reach a very high level of proficiency in individual work. Choral singing is, however, better done. The time allotted to this branch of training is still insufficient at the Aberdeen and St. Andrews Centres. The music selected for singing is generally of an excellent type. In only two instances is Dr. Somervell inclined to take exception to the inferior character of some of the music included in the respective programmes.

Needlework.

Needlework.—The Hon. Mrs. Colborne reports that the teaching of Needlework in the Training Colleges continues to be of an entirely satisfactory character. The need, however, of a fuller knowledge of practical needlework by candidates before their entrance into training is as great as ever. Better grounding is essential in order that the time set apart for needlework in the College may be turned to the best advantage. She anticipates improvement in this respect when candidates for full training come up from the Junior Student Centres. Students so prepared would be then ready to enter upon a training course worthy of the name, in which the acquiring of skill in the teaching of the subject to classes of children would form the main aim of the course. She would like to see the Needlework instruction of all Junior Students placed under the supervision of an Inspectress, whose certificate of proficiency in practical needlework might exempt a student on entering a Training College from further individual work in sewing. Regarding the University Students (formerly King's Students) whose attainments in Needlework are, as a rule, not very advanced, she suggests that either more time should be given for the subject, or else it should be omitted from the list of compulsory subjects. This latter alternative, it may be pointed out, is now an accomplished fact under the new arrangements. Needlework is now

one of the group of optional subjects to be taken by those of the students in training who wish to specialize in any one of these subjects. Under the new system there is every prospect that in this as in other subjects in the optional group accelerated progress will be possible precisely on the lines desiderated by the Inspectress of Sewing.

Cookery and Laundry Work.

Cookery.—Miss Crawford, the Inspectress of Cookery, reports that courses of instruction in Cookery were given to the female students in four Training Colleges, and two Training Centres, and in Laundry Work to the students of one Centre. A short course in Cookery, consisting wholly of demonstration lessons, was besides given to the students of another College.

Attainments.—The methods of instruction, the principles of Cookery taught, and the dishes practised are almost alike in each case; and the students' attainments and proficiency in practical skill differ very slightly. The dropping of Laundry Work out of the course followed at several of the Centres has acted beneficially, the time formerly spent therein being now devoted to extended practice in Cookery.

SECTION IV.

King's Scholarship Examination and the Reports of the Examiners.

Quality of Papers generally.—Little that is new can be said regarding the work done by candidates at this examination. It appears to be more than ever evident that the best students enter the Training Colleges by other avenues, and only the weakest in scholarship attempt this examination. Very few of the revisers have anything good to say of the average paper, and in certain subjects examiners concur in pronouncing most of the papers thoroughly bad. That this is the case chiefly in those subjects which a candidate cannot master successfully from a book indicates that the students must have had very little teaching. Few appear to have had time for general reading, and the state of general culture represented by the average paper is a very low one.

In view of the approaching discontinuance of this Examination it has not been deemed necessary to enter into detailed criticism of the results in the several subjects.

SECTION V.

Reports on Acting Teachers' Papers. (Certificate Examination—July, 1907.)

Quality of Papers Generally.—The reports on these papers are on the whole very much more favourable than those on the King's Scholarship Examination. In one or two cases Examiners who have taken up a subject after the lapse of four or five years

comment in quite strong terms on the improvement in the quality of the work done. As in former years, languages are less satisfactory than any other part of the work. The general impression to be gathered from the reports is that most of the candidates have worked very hard, but have had a somewhat defective previous training.

English.—The set work in English was as a rule excellent. The students had made an exhaustive and successful study of Henry V. But many appeared to have studied Johnson's Lives of Milton and Dryden without having read any of the work of these poets, and in such circumstances answering was naturally limited in range. Essays were free from solecisms, but, as a rule, very commonplace. Little power of literary appreciation or criticism was displayed. The answers to questions on literary history revealed the worst results of the cram-book.

Mathematics.—The women candidates did fairly good work in some respects; but the use of decimals was far too limited, and quite a number of students failed to *approximate* in a sensible fashion. Palpably absurd answers were not uncommon, *e.g.*, one estimate of the height of the Matterhorn was ·0002588 feet, and the number of matches required to fill a box was $1 \cdot 4438502 + !$ Formal Geometry was fair, but too many candidates displayed a lamentable lack of ability to measure distances with a reasonable degree of accuracy. From the constant omission of the middle portion of Question 61 (dealing with the practical division of area), it would appear that the practical treatment of area has not yet received adequate attention. Some improvement was perceptible in graphical work, but there is still room for more.

In Geometrical questions the figures drawn by the men candidates showed a decided improvement, and the tendency to rely on measurement as a means of *proof* is less common than of recent years. As usual, the questions in Solid Geometry were not well done. Algebraical work shewed more readiness of manipulation than acquaintance with the fundamental principles of the subject.

History and Geography.—Very few candidates took these subjects, and the average of attainment was low. The reviser says: "On the whole it is to be hoped that none, except two men, of the candidates will ever have any serious responsibility in regard to the teaching of History."

Question 1 (on map construction) in Geography was not attempted by any of the candidates; Question 8 (on map reading) by only a few. The most striking weakness in the answers was the neglect of the contour lines. The answers to Question 7 shewed very little appreciation of the uses to which the terrestrial globe may be put; and too little distinction was made between the work suitable for a Junior Division and that for a supplementary class. Candidates who shewed a fairly good knowledge of the facts of physiography could not go far in explaining the phenomena set down for discussion.

School Management.—The papers on School Management were, as a whole, of moderate merit. In many cases the meaning of the question was not grasped; in others the answers revealed weak and confused attempts to remember passages of books that had been hurriedly read. One reviser remarks on the narrow interpretation put on words and phrases by the non-graduates. Thus a question on the value of Poetry as a school subject, which led to some very fine answers from graduates as to the place of poetry among instruments of culture, was in almost every case treated by the non-graduate acting teachers as if "repetition" of poetry were meant; and its influence was narrowed down to improving the memory, helping pronunciation, and the like. The prevailing fault was discursiveness. Question B 3 (demanding a scheme of work based on the principle of concentration) and Question D 6 (requiring a scheme of work in Geography) were least satisfactorily done, nor was Question C 4 (on how to secure facility of expression), as a rule, well answered. Pattern reading by the teacher and simultaneous reading by the pupils, together with answering in complete sentences to every question asked, were the usual means employed for securing facility and correctness of expression. Little was said regarding correct and appropriate language by the teacher, the development of confidence on the part of the pupil, or the thorough knowledge of the vocal organs and their method of working which every teacher ought to possess.

Special Paper for Graduates.—The papers written by graduates might perhaps have been expected to show weaknesses due to want of actual experience in school work. There was in them surprisingly little trace of any such weakness. On the other hand, the graduates' papers showed a grasp of the questions, especially those that involved psychological discussion or analysis, a command of easy and adequate language, and what it was even more pleasant to note, an interest and enthusiasm almost entirely absent from the papers of the other candidates. A considerable number of the graduates gained full or nearly full marks.

Music.—Except for the last two questions (which dealt with the beating of time and with the writing of an exercise for voice training) the papers in Music were of satisfactory quality. Considerable ignorance of the range of children's voices was shown, and marks were frequently lost through the omission of the key signature.

Penmanship and Dictation.—Penmanship, on the whole, was good. Much of the small hand was highly creditable both in execution and in style, and there were very few positively bad papers. Text hand was relatively inferior. In many cases it was much too small, and lacked neatness and finish. Although the proportion of Dictation exercises absolutely correct was not large, the general result was quite satisfactory. The words most frequently mis-spelt were *pusillanimity*, *exigencies*, *effete*, and *ossify*, and absurd substitutions for the word *specious* were not uncommon.

Domestic Economy. — As a rule the papers in Domestic Economy were quite satisfactory, though book-work was better done than were questions which required practical experience. While most candidates were acquainted with the physical facts involved, few could frame any reasonable scientific explanation of them. The question on drinking-water proved a stumbling block to many.

Political Economy.—The general quality of the answering in Political Economy is very good. Only 9 papers out of 43 fall below half value. The fundamental general conceptions of the science are as a rule well understood, the only common mistake under this head being a confusion between wealth that is sometimes capital, sometimes not, and such things as air and water which are sometimes wealth and sometimes not. In answer to the question regarding the history of "a credit cycle," one of the candidates gives a lengthy account of the method of purchasing a bicycle on the instalment system.

French.—The Examiners have little that is good to say of the French papers. Many papers were quite worthless and even in the better papers gross errors in accidence and syntax were found. One Examiner sums the matter up thus: "On the whole, one is driven to the conclusion that quite two-thirds of the candidates do not possess sufficient knowledge of French to enable them to read simple narrative with ease. Only a small minority give evidence of having received careful tuition in the language, and comparatively few seem to possess such an acquaintance with French as is likely to be serviceable to them in their profession."

German.—With some few exceptions, the German paper was not well done. The translation into German was specially weak. Most candidates, being compelled probably by circumstances to study the language without assistance, seem not to have had sufficient linguistic training of any kind to enable them to learn for themselves the practical application of accidence and syntax; and the rendering of English *phrases* foreign to the German idiom was a somewhat hopeless task for students unable to find correct German for such a simple sentence as "She could scarcely say why she did not wish to go into the house."

Latin.—The majority of the papers in Latin were of poor quality. Probably the candidates did not as a rule enjoy the advantages of skilled tuition and had neither the leisure nor the linguistic training that would enable them to derive much profit from the study of such a difficult language. Insufficient attention was given to inflections; and in the verse passage the key to the meaning of the passage was lost through ignorance of the historical incident referred to. Very few of the candidates could scan, and still fewer could give the name of the metre. Their knowledge of Latin syntax extended to the ablative absolute, but fell short in most cases of such a familiar use of the subjunctive mood as the indirect question. It seems obvious that the educational value of the study of Latin pursued in this

manner and to this extent cannot be very great—probably hardly enough to repay the time and labour expended on it.

Greek.—The Greek paper was taken by only two candidates.

I cannot close this report without expressing here my hearty thanks to Mr. Crombie, Sub-Inspector, for the very valuable help, great in extent and most ungrudgingly rendered, which he has given me in the preparation of it. I have to thank also Mr. Robb, Sub-Inspector, for his kind special assistance in connexion with Sections IV. and V.

I have the honour to be,

My Lords,

Your Lordships' obedient Servant

A. E. Scougal.

To the Right Honourable
The Lords of the Committee of Council
on Education in Scotland.

LISTS OF TRAINING AUTHORITIES, &c.

Provincial Committees for the Training of Teachers.

(Established under the Minute of 30th Jan., 1905.)

Committee.	Chairman.	Name and Address of Director of Studies.
Aberdeen	W. Dey, Esq., LL.D.	G. Smith, Esq., LL.D., Training College Buildings, Charlotte Street, Aberdeen.
Edinburgh	Professor Chrystal, LL.D.	J. King, Esq., 16, Chambers Street, Edinburgh.
Glasgow	R. S. Allan, Esq.	D. Macleod, Esq., Technical College, Montrose Street, Glasgow.
St. Andrews	Very Rev. Principal Stewart, D.D.	J. Malloch, Esq., Technical Institute, Dundee.

Training Centres under the Management of Provincial Committees.

Centre.	Name and Address of Correspondent.
For both Masters and Mistresses.	
Aberdeen	G. Smith, Esq., LL.D., Training College Buildings, Charlotte Street, Aberdeen.
Dundee (*See St. Andrews*)	
Edinburgh	J. King, Esq., 16, Chambers Street, Edinburgh.
Glasgow	D. Macleod, Esq., Technical College, Montrose Street, Glasgow.
St. Andrews and Dundee	J. Malloch, Esq., Technical Institute, Dundee.

Training Colleges.

Training College.	Name and Address of Correspondent.
For Mistresses only.	
Edinburgh, Scottish Episcopal, *Dalry House.*	Rev. J. R. Leslie, Dalry House, Edinburgh.
Glasgow, Roman Catholic	Miss M. A. Lescher, Roman Catholic Training College, Dowanhill, Glasgow.

CENTRES FOR THE TRAINING OF JUNIOR STUDENTS.

LIST OF SCHOOLS WHICH HAVE BEEN PROVISIONALLY RECOGNISED BY THE SCOTCH EDUCATION DEPARTMENT IN TERMS OF ARTICLE 6 OF THE REGULATIONS FOR THE PRELIMINARY EDUCATION ETC., OF TEACHERS, AS CENTRES FOR THE TRAINING OF JUNIOR STUDENTS.

County.	† Name of Centre.	Name and Address of Correspondent.
ABERDEEN.	Aberdeen Central H.G.P.S.	T. Hector, 22, Union Terrace Aberdeen.
	*Aberdeen Queen's Cross R.C.H.G.S.	Madame Bodkin, Convent of the Sacred Heart, Queen's Cross, Aberdeen.
	Huntly Gordon H.G.P.S.	J. Dickson, 9, Square, Huntly.
	Inverurie H.G.P.S. - -	A. J. Smith, 7, West High Street, Inverurie.
	Peterhead (B) Academy H.G.P.S.	T. Mackie, Court House, Peterhead.
	Turriff H.G.P.S. - -	W. F. Stewart, High Street, Turriff.
ARGYLL	Campbeltown (B) Grammar H.G.P.S.	D. M. Maxtone, Campbeltown.
	Dunoon, &c., Grammar H.G.P.S.	D. Anderson, British Linen Bank Buildings, Dunoon.
	Oban (B) H.G.P.S. - -	W. Jolly, Columba Buildings Oban.
AYR.	Ardrossan Academy H.G.P.S.	J. Cook, Town Clerk's Office, Ardrossan.
	Ayr Academy - - -	J. H. Goudie, Clerk to the Burgh School Board, Wellington Chambers, Ayr.
	Beith Spier's School -	W. Williamson, Union Bank, Beith.
	Girvan (Town) H.G.P.S.	T. G. Tait, Girvan.
	Irvine Royal Academy -	W. C. Wilson, Clerk to the Burgh School Board, Irvine.
	Kilmarnock (B) Academy H.G.P.S.	J. P. Stevenson, Kilmarnock.
BANFF.	Aberlour H.G.P.S. - -	H. Stewart, Royal Bank Buildings, Elgin.
	Banff Academy H.G.P.S.	J. A. Badenoch, High Street, Banff.
	Keith Grammar H.G.P.S.	Thurburn & Fleming, Keith.
	Mortlach H.G.P.S. - -	A. Walkinshaw, North of Scotland Bank, Dufftown, Banffshire.
	Rathven Buckie H.G.P.S.	J. Simpson (*Int.*), Town and County Bank, Buckie.
BERWICK.	Duns, The Berwickshire High School.	W. Home Waite, Clerk to the School Board, 12, Newtown Street, Duns.
BUTE.	Rothesay (B) Academy and Thomson's Institute H.G.P.S.	R. D. Whyte, Rothesay.
CAITHNESS.	Thurso Miller Institution H.G.P.S.	J. W. Galloway, Junior, Thurso.
	Wick (B) Pulteneytown Academy H.G.P.S.	D. W. Georgeson, Wick.
CLACKMANNAN.	Alloa (B) Academy H.G.P.S.	J. Cuthbert, Candleriggs, Alloa.
	Alva Academy H.G.P.S.	J. McWhirter, Union Bank House. Alva.
	Dollar Institution - -	T. J. Young, Dollar Institution, Dollar, Clackmannanshire.

* Conditionally recognized.
† In column 2 the letters "H.G.P.S." stand for "Higher Grade Public School."

County.	† Name of Centre.	Name and Address of Correspondent.
DUMBARTON.	*Bonhill Vale of Leven Academy, H.G.P.S.	J. Brown, School Board Offices, Alexandria, Dumbartonshire.
	Dumbarton (B) Academy H.G.P.S.	A. Roberts, Municipal Buildings, Dumbarton.
	Old Kilpatrick Clydebank H.G.P.S.	J. McBride, 63, Kilbowie Road, Clydebank, Glasgow.
	Row Helensburgh Hermitage H.G.P.S.	Maclachlan & Kyle, Municipal Buildings, Helensburgh.
DUMFRIES.	Dumfries Academy - -	J. E. Blacklock, Clerk to the Burgh School Board, 93, Irish Street, Dumfries.
	Dumfries, Mount St. Michael's College.	Rev. D. O'Brien, St. Andrew's House, Dumfries.
EDINBURGH.	Edinburgh Boroughmuir H.G.P.S.	G. W. Alexander, M.A., Castle Terrace, Edinburgh.
	Edinburgh, Broughton H.G.P.S.	
	Lasswade H.G.P.S.- -	C. K. Brown, Eliza Bank, Loanhead, Midlothian.
	Leith (B) Academy H.G.P.S.	R. Hardie, 8, Links Place, Leith.
	The Holy Cross Higher Grade Academy.	Rev. J. Forsyth, St. Cuthbert's, Slateford Road, Edinburgh.
ELGIN.	Bellie Fochabers Milne's Institution H.G.S.	C. Gray, Fochabers.
	Cromdale Grantown H.G.P.S.	R. C. Lobban, Carr Bridge, Inverness-shire.
	Elgin Academy - -	E. D. Jameson, Clerk to the Burgh School Board, Elgin.
	Forres (B) H.G.P.S. -	C. G. Mackenzie, High Street, Forres.
FIFE.	Anstruther, Waid Academy	D. Cook, Anstruther.
	Cupar, Bell Baxter School	R. J. Davidson, 24, St. Catherine Street, Cupar.
	Dunfermline High School	D. Gorrie, Clerk to the Burgh School Board, 4, Maygate, Dunfermline.
	Kirkcaldy High School -	A. Beveridge, Clerk to the School Board, Kirkcaldy.
	St. Andrews, Madras College.	C. S. Grace, Market Street, St. Andrews.
	Wemyss Buckhaven H.G.P.S.	A. W. Taylor, Clerk to the Wemyss School Board, East Wemyss.
FORFAR.	Arbroath High School -	W. Alexander, Clerk to the Burgh School Board, 62, High Street, Arbroath.
	Brechin High School -	J. Craig, Clerk to the Burgh School Board, 5, Swan Street, Brechin.
	Broughty Ferry, Grove Academy H.G.P.S.	E. Cowan, Royal Bank Buildings, High Street, Dundee.
	Dundee, Harris Academy H.G.P.S.	J. E. Williams, School Board Offices, Dundee.
	Dundee, Morgan Academy H.G.P.S.	
	Forfar Academy - -	A. Hay, Clerk to the Burgh School Board, 20, East High Street, Forfar.
	Montrose Academy - -	W. Ross, Clerk to the Burgh School Board, 10, Castle Street, Montrose.

* Conditionally recognised. † See footnote on page 45.

County.	† Name of Centre.	Name and Address of Correspondent.
HADDINGTON.	Dunbar (B) H.G.P.S.	R. White, Dunbar.
	Haddington, Knox Institute	T. W. Todrick, Clerk to the Combined School Board, Haddington.
	North Berwick High School	A. D. Wallace, Clerk to the School Board, East Road, North Berwick.
INVERNESS.	Inverness Royal Academy	W. C. MacBean, Clerk to the School Board, 42 Union Street, Inverness.
	Kilmallie, Fort William H.G.P.S.	D. McLeish, Parade House, Fort William
	Kingussie H.G.P.S.	L. Mackintosh, Kingussie.
	Portree H.G.P.S.	R. Macdonald, National Bank, Portree.
KINCARDINE.	Stonehaven, Mackie Academy	J. Falconer, Stonehaven.
KIRKCUDBRIGHT.	Kirkcudbright Academy	A. Cavan, Clerk to the School Board, Kirkcudbright.
LANARK.	Airdrie (B) Academy H.G.P.S.	G. B. Motherwell, 10, Bank Street, Airdrie.
	Biggar H.G.P.S.	A. Russell, Howieson Buildings, Biggar.
	Bothwell Bellshill Academy H.G.P.S.	R. Kerr, 50, Cadzow Street, Hamilton.
	Cambusnethan, Wishaw H.G.P.S.	T. Smith, Commercial Bank, Wishaw.
	Dalziel H.G.P.S.	W. R. Barbour, Motherwell.
	Glasgow Hutchesons' Boys' Grammar S.	W. H. Macdonald, 158, Ingram Street, Glasgow.
	Glasgow Hutchesons' Girls' Grammar S.	
	Glasgow Kent Road H.G.P.S.	J. Clark, 129, Bath Street, Glasgow.
	Glasgow Pupil Teachers' Institute	
	Glasgow Whitehill H.G.P.S.	
	Glasgow Woodside H.G.P.S.	
	Glasgow St. Mungo's Academy H.G.R.C.S.	J. Annias, 84, Henrietta Street, Glasgow.
	Govan, Dowanhill H.G.R.C. Practising S.	Miss Lescher, 17, Victoria Circus, Dowanhill, Glasgow.
	Govan Pollokshields Albert Road H.G.P.S.	M. MacLeod, 151, Bath Street, Glasgow.
	Govan Bellahouston Academy H.G.P.S.	
	*Hamilton Academy	P. Keith, Clerk to the Burgh School Board, 67, Cadzow Street, Hamilton.
	Lanark (B) Grammar H.G.P.S.	J. F. Shirley, Lanark.
	Maryhill North Kelvinside H.G.P.S.	W. B. Gemmel, 208, West George Street, Glasgow.
	Old Monkland Coatbridge H.G.P.S.	W. J. Andrew, Municipal Buildings, Coatbridge.
LINLITHGOW.	*Bathgate Academy H.G.S.	Messrs. Scott-Moncrieff, Thomson and Shiells, 141, George Street, Edinburgh.
	Bo'ness Academy H.G.P.S.	R. J. Jamieson, Bo'ness, Linlithgowshire.
	Linlithgow Academy	A. Turnbull, Linlithgow.

* Conditionally recognised. † See footnote on page 45.

County.	† Name of Centre.	Name and Address of Correspondent.
NAIRN.	Nairn, Rose's Academical Institution	A. Robertson, 34, High Street Nairn.
ORKNEY.	Kirkwall (B) H.G.P.S.	J. Begg, 27, Bridge Street, Kirkwall.
	Stromness H.G.P.S.	J. A. S. Brown, Stromness, Orkney.
PEEBLES.	Peebles Burgh and County High School	W. Lyon, Clerk to the School Board, Bank of Scotland, Peebles.
PERTH.	Blairgowrie H.G.P.S.	R. R. Black, Bank Street, Blairgowrie.
	Callander, McLaren High School	W. Thomson, Clerk to the School Board, Bank of Scotland, Callander, Perthshire.
	Crieff, Morrison's Academy	P. Murray, 43, Castle Street, Edinburgh.
	Perth Academy	P. Martin, Clerk to the School Board, Tay Street, Perth.
RENFREW.	Cathcart Queen's Park H.G.P.S.	G. J. Cameron, 104, West Regent Street, Glasgow.
	Greenock (B) Holmscroft H.G.P.S.	A. F. Niven, Municipal Buildings, Wallace Place, Greenock.
	Paisley (B) Grammar School and Wm. B. Barbour Academy.	MacRobert and Hutchison, Clerks to the Burgh School Board, 6, St. James Place, Paisley.
ROSS.	Dingwall Academy H.G.P.S.	A. Ross, Dingwall.
	Rosskeen, Invergordon Academy H.G.P.S.	W. George, High Street, Invergordon, Ross-shire.
	Stornoway Nicolson Institute H.G.P.S.	W. J. Clarke, County Buildings, Stornoway.
	Tain Royal Academy	W. T. Mactavish, County Buildings, Tain.
ROXBURGH.	Kelso High School	T. D. Crichton Smith, Clerk to the School Board, 66, Woodmarket, Kelso.
SELKIRK.	Selkirk High School	J. Steedman, Selkirk.
SHETLAND.	*Lerwick, Anderson Educational Institute, H.G.P.S.	R. D. Ganson, Lerwick.
STIRLING.	Falkirk High School	T. Gibson, Clerk to the Burgh School Board, Bank Street, Falkirk.
	Stirling High School	J. Brown, Clerk to the Burgh School Board, 10, Barnton Street, Stirling.
SUTHERLAND.	Golspie H.G.P.S.	D. Peters, County Buildings, Dornoch, Sutherlandshire.
WIGTOWN	Newton Stewart, Douglas High School (Girls).	J. McGill, Newton Stewart.
	Newton Stewart, Ewart High School (Boys).	

* Conditionally recognised. † See footnote on page 45.

*EXAMINATION OF CANDIDATES FOR RECOGNITION AS QUALIFIED TEACHERS OF MODERN LANGUAGES.

Papers Set in 1907 at the Written Examination.

French.

Saturday, 16th March.—10 A.M. to 1 P.M.

I. Traduire très soigneusement en français :

"Me, my love?" cried his wife, hearing and understanding only in part. "Are you talking about me? I am sure nobody ought to be, or can be, a greater advocate for matrimony than I am; and if it had not been for the misery of her leaving Hartfield, I should never have thought of Miss Taylor but as the most fortunate woman in the world; and as to slighting Mr. Weston—that excellent Mr. Weston—I think there is nothing that he does not deserve. I believe he is one of the best-tempered men that ever existed. Excepting yourself and your brother, I do not know his equal for temper. I shall never forget his flying Henry's kite† for him that very windy day last Easter; and ever since his particular kindness last September twelvemonth in writing that note, at twelve o'clock at night, on purpose to assure me that there was no scarlet fever ‡ at Cobham, I have been convinced that there could not be a more feeling heart nor a better man in existence. If anybody can deserve him, it must be Miss Taylor."

† Kite = un cerf-volant.
‡ Scarlet fever =la fièvre scarlatine.

II. Résumer, en français, le morceau suivant, et apprécier la pensée qui en forme la conclusion.

Le lézard sur les ruines de Rome.

Un jour, seul dans le Colisée,
Ruine de l'orgueil romain,
Sur l'herbe de sang arosée
Je m'assis, Tacite à la main.

Je lisais les crimes de Rome,
Et l'empire à l'encan vendu,
Et, pour élever un seul homme,
L'univers si bas descendu.

* For further particulars of these Examinations see the Memorandum of 10th September, 1907, published with the Regulations for the Preliminary Education, &c., of Teachers.

Je voyais la plèbe idolâtre,
Saluant les triomphateurs,
Baigner ses yeux sur le théâtre
Dans le sang des gladiateurs.

Sur la muraille qui l'incruste,
Je recomposais lentement
Les lettres du nom de l'Auguste
Qui dédia le monument.

J'en épelais le premier signe.
Mais, déconcertant mes regards,
Un lézard dormait sur la ligne
Où brillait le nom des Césars.

Seul héritier des sept collines,
Seul habitant de ces débris.
Il remplaçait sous ces ruines
Le grand flot des peuples taris.

Sorti des pentes de murailles,
Il venait, de froid engourdi,
Réchauffer ses vertes écailles
Au contact du bronze attiédi.

Consul, César, maître du monde,
Pontife, Auguste, égal aux dieux,
L'ombre de ce reptile immonde
Eclipsait ta gloire à mes yeux !

La nature a son ironie,
Le livre échappa de ma main.
O Tacite, tout ton génie
Raille moins fort l'orgueil humain !

LAMARTINE.

III. Composition française.

Traiter l'un des sujets suivants :—

(*a*) Expliquer, développer et discuter l'idée-suivante d'un pédagogue français :

> "Il y a deux sortes de lecture : l'une approfondie, laquelle se propose de ne laisser rien de douteux, aucune obscurité ; l'autre plus rapide, plus superficielle, la lecture cursive. Les deux seront employées tour à tour, quelquefois pour le même texte, la première surtout en classe, la seconde à la maison. Mais cursive ou approfondie, la lecture doit être faite pour elle-même, sans dépenser le temps à la lente élaboration d'une traduction."

ou,

(*b*) Indiquer, dans une lettre à un ami français, les traits essentiels de la vie scolaire en Ecosse.

German.

Saturday, 16th March—2 to 5 P.M.

(German script should be used at least in the passage for translation into German, 2. Candidates are advised to devote about one hour to Question 3.)

1. Translate into good English:—

(*a*) Als ich zum erstenmal den wunderbaren Lobgesang des heiligen Franciscus las, der alle Elemente und Creaturen mit geschwisterlicher Liebe umfaßt, war ich entzückt über das zärtliche „unsere Schwester, das Wasser" und hatte damit den Namen für meine Liebe zu allem Wasser gefunden. Wie eine Schwester liebte ich es, und wie eine Schwester verstand es mich, liebte mich wieder und erschloß mir seine zahllosen geheimen Schönheiten, denen noch nie ein Maler oder Dichter gerecht geworden ist. Wer sollte auch das Wasser nicht lieben! Es ist beweglich, weich, rein, mächtig, es spiegelt den Himmel und die unsichtbaren Farben der Luft, es redet und singt vom süßen Plauderton bis zum unwiderstehlichen Sturmlied, es zieht in köstlichen Schleiern am Himmel hin. Wie oft stand ich bezaubert in dem Anblick des mittäglich leuchtenden Meeres versunken oder der Abendspiegelung eines Bergsees. Mit besonderem Reize zeigt mir die Erinnerung sodann die Nächte einer Fußwanderung dem Ufer eines Stromes entlang. Dies dunkle Rauschen des Weggenossen, dies ewig gewaltige Ziehen ohne Rast und Ende, woneben all meine Wanderschaft nur eine kurze Reise war! In solchen Stunden spürt man den Atem der großen Natur und den Herzschlag der Erde. Hesse.

(*b*)

Ich wandle still den Waldespfad,
Es dunkelt die Nacht herein.
Im Grunde rauscht ein Mühlenrad,
Der Grillen Lied fällt ein.

Wie liegt so tief, wie liegt so weit
Die Welt im Mondesduft!
Die Stimme der Waldeinsamkeit
Im Windessäuseln ruft:

Wirf ab dein bang erträumtes Weh
Wirf ab die falsche Lust!
Sie schmelzen hin wie Märzenschnee,
Und öde bleibt die Brust.

Blick auf, wo Stern an Stern entbrennt,
Und sprich' dein Herz zur Ruh;
Denn ew'ger als das Firmament,
Du kleines Licht, bist Du!

P. Heyse.

2. Translate into German:—

It was now deep night. Perseus looked upward, and saw the round, bright, silvery moon, and thought that he should desire nothing better than to soar up to her, and spend his life there. Then he looked downward again, and saw the earth, with its seas and lakes and the silver courses of its rivers, and its snowy mountain peaks, and the breadth of its fields, and the dark cluster of its woods, and its cities of white marble; and, with the moonshine sleeping over the whole scene, it was as beautiful as the moon or any star could be. And among other objects he saw the island of Seriphus, where his dear mother was. Sometimes he and Quicksilver approached a cloud, that at a distance looked as if it were made of fleecy silver; although, when they plunged into it, they found themselves chilled and moistened with grey mist. So swift was their flight, however, that, in an instant, they emerged from the cloud into the moonlight again. Once a high soaring eagle flew right against the invisible Perseus. The bravest sights were the meteors, that gleamed suddenly out as if a bonfire had been kindled in the sky, and made the moonshine pale for as much as a hundred miles around them.

HAWTHORNE.

3. Write a short German essay of about 200 to 300 words on *either* of the following subjects:—

(*a*) Describe, in detail, a town with which you are familiar.

(*b*) Give an account of a ballad or short story you have recently read;

or, write a letter in German, describing a walk along a busy street.

STATISTICS FOR THE YEAR 1906–1907.

LIST OF TABLES.

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Further Instruction of Teachers.

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9. Lists of Courses for the further instruction of Teachers sanctioned by the Department during the year 1906–7.
10. Summary under Subjects of Table 9, and of similar Tables for previous years.

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11. Summary of Results of King's Scholarship Examination, 1906.
12. Summary of Results of Certificate Examination, 1907.

Table 1.

Table showing the number of Junior Students in Training during the year 1906–7, and the Grants paid in respect of those Students.

Name of Centre in County Order.	Number of Students in training during year (all in 1st year of training.)			Number who left during or at the end of the year without completing their course of training.			Grant Paid.		
	Males.	Females.	Total.	Males.	Females.	Total.	£	s.	d.
Aberdeen									
Aberdeen Central H.G.P.S.	—	—	—	—	—	—	-		-
Huntly Gordon H.G.P.S.	—	5	5	—	3	3	38	13	4
Peterhead (B) Academy H.G.P.S.	2	5	7	—	—	—	52	13	4
Argyll									
Dunoon, etc. Grammar H.G.P.S.	—	4	4	—	—	—	32	0	0
Oban (B) H.G.P.S.	2	5	7	1	—	1	56	0	0
Ayr									
Ardrossan Academy H.G.P.S.	2	5	7	—	—	—	56	0	0
Ayr Academy	2	1	3	1	—	1	14	13	4
Beith Spier's School	4	4	8	—	1	1	60	0	0
Girvan (Town) H.G.P.S.	2	3	5	—	—	—	40	0	0
Irvine Royal Academy	1	4	5	—	—	—	40	0	0
Kilmarnock (B) Academy H.G.P.S.	1	19	20	—	2	2	154	0	0
Banff									
Aberlour H.G.P.S.	—	—	—	—	—	—	-		-
Banff Academy H.G.P.S.	1	4	5	—	—	—	32	0	0
Keith H.G.P.S.	—	3	3	—	2	2	24	0	0
Mortlach H.G.P.S.	—	3	3	—	—	—	24	0	0
Rathven Buckie H.G.P.S.	1	4	5	—	—	—	40	0	0
Berwick									
Duns, The Berwickshire High School	—	—	—	—	—	—	-		-
Caithness									
Thurso Miller Institution H.G.P.S.	—	4	4	—	—	—	32	0	0
Wick (B) Pulteneytown Academy H.G.P.S.	2	10	12	1	1	2	90	13	4
Clackmannan									
Alloa (B) Academy H.G.P.S.	—	2	2	—	1	1	16	0	0
Dollar Institution	2	2	4	—	—	—	28	0	0
Dumbarton (B) Academy H.G.P.S.	1	5	6	—	—	—	44	0	0
Old Kilpatrick Clydebank H.G.P.S.	5	3	8	—	—	—	*48	0	0
Row Helensburgh Hermitage H.G.P.S.	2	4	6	—	—	—	48	0	0
Dumfries									
Dumfries Academy	2	7	9	—	—	—	52	0	0
Edinburgh									
Edinburgh Boroughmuir H.G.P.S.	6	20	26	—	1	1	202	13	4
Edinburgh Broughton H.G.P.S.	3	17	20	—	—	—	157	6	8
Lasswade H.G.P.S.	2	1	3	—	—	—	24	0	0
Leith (B) Academy H.G.P.S.	5	20	25	—	—	—	194	13	4
Elgin									
Bellie Fochabers Milnes Institution H.G.S.	3	2	5	1	1	2	38	13	4
Cromdale Grantown H.G.P.S.	—	1	1	—	—	—	8	0	0
Elgin Academy	—	5	5	—	—	—	40	0	0
Forres (B) H.G.P.S.	—	—	—	—	—	—	-		-

* Part of the Grant to this Centre is not yet paid

Name of Centre in County Order.	Number of Students in training during year (all in 1st year of training.			Number who left during or at the end of the year without completing their course of training.			Grant Paid.		
	Males.	Females.	Total.	Males.	Females.	Total.	£	s.	d.
Fife									
Anstruther Waid Academy	—	8	8	—	3	3	56	0	0
Cupar Bell Baxter School	—	7	7	—	1	1	45	6	8
Dunfermline High School	—	5	5	—	—	—	40	0	0
Kirkcaldy High School	—	4	4	—	—	—	26	13	4
Forfar									
Arbroath High School	1	2	3	1	1	2	24	0	0
Brechin High School	—	—	—	—	—	—	–		–
Broughty Ferry Grove Academy H.G.P.S.	—	5	5	—	—	—	40	0	0
Dundee Harris Academy H.G.P.S.	—	3	3	—	—	—	20	0	0
Dundee Morgan Academy H.G.P.S.	1	8	9	—	—	—	70	13	4
Forfar Academy	2	4	6	—	—	—	48	0	0
Montrose Academy	1	5	6	—	—	—	48	0	0
Haddington									
Dunbar (B) H.G.P.S.	3	2	5	1	—	1	40	0	0
Haddington Knox Institute	1	1	2	—	—	—	16	0	0
North Berwick High School	3	1	4	—	—	—	32	0	0
Inverness									
Kilmallie Fort William H.G.P.S.	—	2	2	—	—	—	16	0	0
Kingussie H.G.P.S.	—	—	—	—	—	—	–		–
Portree H.G.P.S.	—	—	—	—	—	—	–		–
Kincardine									
Stonehaven Mackie Academy	—	—	—	—	—	—	–		–
Kirkcudbright									
Kirkcudbright Academy	1	1	2	—	—	—	14	0	0
Lanark									
Airdrie (B) Academy H.G.P.S.	3	1	4	2	1	3	32	0	0
Biggar H.G.P.S.	—	2	2	—	1	1	13	6	8
Cambusnethan Wishaw H.G.P.S.	1	2	3	1	—	1	24	0	0
Dalziel H.G.P.S.	3	6	9	—	—	—	72	0	0
Glasgow, Hutchesons' Boys' Gram. S.	—	—	—	—	—	–	–		–
Glasgow, Hutchesons' Girls' Gram. S.	—	3	3	—	—	—	21	6	8
Glasgow, Pupil Teachers' Institute	5	31	36	1	1	2	284	13	4
Glasgow, St. Mungo's Academy H.G.R.C.S.	6	—	6	—	—	—	48	0	0
Govan Dowanhill H.G.R.C.S.	—	1	1	—	—	—	6	13	4
Govan Pupil Teachers' Institute	7	12	19	—	—	—	132	0	0
Hamilton Academy	2	5	7	—	—	—	42	13	4
Lanark (B) Grammar H.G.P.S.	—	3	3	—	—	—	22	0	0
Maryhill North Kelvinside H.G.P.S.	2	2	4	—	—	—	29	6	8
Linlithgow									
Bo'ness Academy H.G.P.S.	1	4	5	—	—	—	40	0	0
Linlithgow Academy	1	4	5	—	1	1	32	0	0
Nairn									
Nairn, Rose's Academical Institution	1	2	3	–	—	—	24	0	0

Name of Centre in County Order.	Number of Students in training during year (all in 1st year of training.			Number who left during or at the end of the year without completing their course of training.			Grant Paid.		
	Males.	Females.	Total.	Males.	Females.	Total.	£	s.	d.
Orkney									
Kirkwall (B) H.G.P.S.	1	6	7	1	1	2	56	0	0
Stromness H.G.P.S.	—	4	4	—	—	—	32	0	0
Peebles									
Peebles Burgh and County High School	—	3	3	—	—	—	24	0	0
Perth									
Blairgowrie H.G.P.S.	—	6	6	—	2	2	45	6	8
Callander McLaren High School	—	4	4	—	—	—	32	0	0
Perth Academy	1	10	11	—	—	—	85	6	8
Renfrew									
Cathcart Queen's Park H.G.P.S.	—	10	10	—	—	—	56	0	0
Greenock (B) Holmscroft H.G.P.S.	3	15	18	—	—	—	141	6	8
Paisley Grammar School and Wm. B. Barbour Academy	4	2	6	1	—	1	32	0	0
Ross									
Dingwall Academy H.G.P.S.	1	4	5	—	—	—	40	0	0
Rosskeen Invergordon Academy H.G.P.S.	1	5	6	—	—	—	48	0	0
Stornoway Nicolson Institute H.G.P.S.	—	—	—	—	—	—	–		–
Tain Royal Academy	—	3	3	—	—	—	21	6	8
Roxburgh									
Kelso High School	—	3	3	—	—	—	24	0	0
Selkirk									
Selkirk High School	1	2	3	—	—	—	24	0	0
Stirling									
Falkirk High School	2	14	16	—	—	—	108	0	0
Stirling High School	1	2	3	—	—	—	24	0	0
Sutherland									
Golspie, H.G.P.S.	—	—	—	—	—	—	–		–
Wigtown									
Newton Stewart Douglas High School (Girls)	—	4	4	–	2	2	32	0	0
Newton Stewart Ewart High School (Boys)	2	—	2	2	—	2	16	0	0
Totals	113	405	518	14	26	40	3,790	0	0

TABLE 2.

Table of Grants for the Training of Teachers paid for the year ended July 31st, 1907.

Provincial Committees.	Grants under Article 60 of the Regulations.	Contributions from General Aid Grant under Article 63 of the Regulations.	Total Grants.
	£ s. d.	£ s. d.	£ s. d.
Aberdeen	3,767 0 0	—	3,767 0 0
Edinburgh	3,476 0 0	41 14 0	3,517 14 0
Glasgow	9,680 10 0	—	9,680 10 0
St. Andrews	5,101 0 0	—	5,101 0 0
Total	22,024 10 0	41 14 0	22,066 4 0

Training Colleges.	Grants under Article 60 of the Regulations.
	£ s. d.
Aberdeen Church of Scotland	3,470 0 0*
,, United Free Church	4,810 0 0
Edinburgh Church of Scotland	6,245 0 0*
,, United Free Church	7,938 10 0
,, Episcopal	2,346 10 11
Glasgow Church of Scotland	6,830 0 0*
,, United Free Church	6,960 0 0*
,, Roman Catholic	5,092 0 0
	43,692 0 11

* Instalments paid. The balance of grant for the year in each of these cases has not yet been paid.

TOTAL GRANTS :—Article 60	65,716 10 11
Article 63 (General Aid Grant)	41 14 0
Total	£65,758 4 11

Table 3.

Table showing particulars of Students in full Training during the Year, 1906–7

Centres.	Number for which recognised	No. of Students in training during Year.												Number of such Students, who :—											
		Men.				Women.				Total.				Were resident in approved hostels, or Residential Colleges.			Attended University Classes.			*Passed out of training during, or at the end of the Year.					
		1st Year.	2nd Year.	3rd Year.	Total.	1st Year.	2nd Year.	3rd Year.	Total.	1st Year.	2nd Year.	3rd Year.	Total.	Men.	Women.	Total.	Men.	Women.	Total.	1st Year.	2nd Year.	3rd Year.	Total.		
Training Centres :—																									
Aberdeen	(*Not definitely fixed.*)	19	9	8	36	26	33	18	77	45	42	26	113	—	—	—	36	77	113	1	9	24	24		
Edinburgh		22	—	—	22	81	—	—	81	103	—	—	103	—	—	—	22	81	103	21	—	—	21		
Glasgow		50	22	12	84	93	69	45	207	143	91	57	291	—	—	—	84	207	291	4	11	54	69		
St. Andrews and Dundee		14	2	1	17	101	22	14	137	115	24	15	154	—	—	—	12	82	94	20	13	14	47		
Totals for Centres		105	33	21	159	301	124	77	502	406	157	98	661	—	—	—	154	447	601	46	33	92	171		
Training Colleges :—																									
Aberdeen Church of Scotland	130	10	7	2	19	53	58	—	111	63	65	2	130	—	27	27	15	4	19	—	60	2	62		
„ United Free Church	130	10	19	9	38	59	43	—	102	69	62	9	140	—	—	—	22	4	26	9	53	9	71		
Edinburgh Church of Scotland	220	36	31	11	78	90	53	12	155	126	84	23	233	—	44	44	52	56	108	12	56	23	91		
„ United Free Church	220	30	35	16	81	82	61	9	152	112	96	25	233	—	65	65	47	36	83	12	80	25	117		
„ Episcopal	72	—	—	—	—	35	37	—	72	35	37	—	72	—	62	62	—	6	6	—	37	—	37		
Glasgow Church of Scotland	256	39	33	2	74	141	87	4	232	180	120	6	306	—	38	38	47	13	60	24	111	6	141		
„ United Free Church	250	40	41	4	85	111	80	4	195	151	121	8	280	—	—	—	81	19	100	11	102	8	121		
„ Roman Catholic	200	—	—	—	—	81	59	—	140	81	59	—	140	—	140	140	—	7	7	—	58	—	58		
Totals for Training Colleges	1,472	165	166	44	375	652	478	29	1159	817	644	73	1534	—	376	376	264	145	409	68	557	73	698		
Grand Totals	—	207	199	65	534	953	602	106	1661	1223	801	171	2195	—	376	376	418	592	1010	114	590	165	869		

* For further particulars as to the Students who passed out of Training see Table 4.

TABLE 4.

TABLE SHOWING PARTICULARS of outgoing Students referred to in Table 3.

	Teachers already certificated who successfully completed one year of training. (Art. 74.)			Number recognised as Certificated Teachers after completing																							
				One year of training as						Two years of training.			Three years of training.			Total number recognised as Certificated Teachers.			Number who obtained the General Certificate, but did not satisfy the requirements of the Superannuation Act.			Number who completed their course of training, but were refused the General Certificate.			Number who left without completing their course of training.		
				Graduates.			Acting teachers qualified under Act 73 (*c.*)																				
	Males.	Females.	TOTAL.	Males.	Females.	TOTAL.	Males.	Females.	TOTAL.	Males.	Females.	TOTAL.	Males.	Females.	TOTAL.	Males.	Females.	TOTAL.	Males.	Females.	TOTAL.	Males.	Females	TOTAL.	Males.	Females.	TOTAL.
Training Centres :—																											
Aberdeen	1	—	1	—	—	—	—	—	—	3	5	8	7	17	24	10	22	32	—	—	—	—	*1	1	—	—	—
Edinburgh	1	3	4	2	14	16	—	—	—	—	—	—	—	—	—	2	14	16	1	—	1	—	—	—	—	—	—
Glasgow	—	—	—	—	—	—	—	—	—	8	3	11	12	42	54	20	45	65	—	—	—	—	—	—	2	2	4
St. Andrews and Dundee	—	1	1	1	—	1	1	17	18	1	12	13	1	13	14	4	42	46	—	—	—	—	—	—	—	—	—
Totals for Centres	2	4	6	3	14	17	1	17	18	12	20	32	20	72	92	36	123	159	1	—	1	—	1	1	2	2	4
Training Colleges :—																											
Aberdeen Church of Scotland	—	—	—	—	—	—	—	—	—	3	57	60	2	—	2	5	57	62	—	—	—	—	—	—	—	—	—
,, United Free Church	—	1	1	—	—	—	—	8	8	11	42	53	9	—	9	20	50	70	—	—	—	—	—	—	—	—	—
Edinburgh Church of Scotland	2	—	2	—	—	—	2	8	10	24	32	56	11	12	23	37	52	89	—	—	—	—	—	—	—	—	—
,, United Free Church	—	4	4	—	—	—	3	5	8	28	51	79	16	9	25	47	65	112	—	—	—	*1	—	1	—	—	—
,, Episcopal	—	—	—	—	—	—	—	—	—	—	37	37	—	—	—	—	37	37	—	—	—	—	—	—	—	—	—
Glasgow Church of Scotland	—	—	—	—	—	—	2	22	24	26	85	111	2	4	6	30	111	141	—	—	—	—	—	—	—	—	—
,, United Free Church	—	—	—	—	—	—	—	11	11	29	73	102	4	4	8	33	88	121	—	—	—	—	—	—	—	—	—
,, Roman Catholic	—	—	—	—	—	—	—	—	—	—	58	58	—	—	—	—	58	58	—	—	—	—	—	—	—	—	—
Totals for Training Colleges	2	5	7	—	—	—	7	54	61	121	435	556	44	29	73	172	518	690	—	—	—	1	—	1	—	—	—
GRAND TOTALS	4	9	13	3	14	17	8	71	79	133	455	588	64	101	165	208	641	849	1	—	1	1	1	2	2	2	4

* Under consideration.

Table 5.

Statement showing the Number of outgoing Students referred to in Table 4 who were recognised as qualified to teach certain subjects in terms of Article 37 (*b*) of the Regulations.

	Males.				Females.					
	Recognised as qualified to teach.				Recognised as qualified to teach.					
	Physical Exercises.	Drawing.	Singing.	Woodwork.	Physical Exercises.	Drawing.	Singing.	Needlework.	Domestic Subjects.	Educational Handwork (other than Woodwork).
Training Centres:—										
Aberdeen - - - -	10	10	2	—	20	22	9	22	—	—
Edinburgh - - - -	2	—	—	—	5	1	2	1	—	—
Glasgow - - - - -	20	18	9	—	45	43	24	39	—	—
St. Andrews and Dundee -	4	4	3	—	43	32	23	43	27	—
Training Colleges:—										
Aberdeen Church of Scotland	5	3	2	5	57	56	46	57	57	—
,, United Free Church	20	17	1	10	51	42	31	51	37	—
Edinburgh Church of Scotland	39	39	32	—	52	51	44	51	25	—
,, United Free Church	47	45	33	38	67	67	42	69	44	—
,, Episcopal - -	—	—	—	—	35	37	32	37	—	37
Glasgow Church of Scotland -	30	30	22	—	112	108	70	111	—	—
,, United Free Church	33	32	20	31	88	87	61	88	—	85
,, Roman Catholic -	—	—	—	—	56	56	45	58	—	31
	210	198	124	84	631	602	429	627	190	153

TABLE 6.

STATEMENT SHOWING THE RESULTS of the Written and Oral Examination of Candidates for recognition under the Memorandum of 1st January, 1907, as qualified Teachers of Modern Languages—1907.

	French.			German.		
	Males.	Females.	TOTAL.	Males.	Females.	TOTAL.
No. of Students in training presented. (Including ex-Students) - - -	18	366	384	4	118	122
No. of other candidates presented - -	24	26	50	2	10	12
TOTAL -	42	392	434	6	128	134
No. who obtained recognition as qualified Teachers - - - - - - -	10	156	166	3	92	95
No. who passed written Examination only - - - - - - - - -	1	38	39	—	2	2
No. who passed Oral Examination only -	8	79	87	3	27	30
No. of unsuccessful Candidates - -	23	119	142	—	7	7

TABLE 7.

STATEMENT SHOWING THE NUMBER OF persons who were recognised respectively as Trained and as Untrained Certificated Teachers in each of the years 1898 to 1907, and the number of Teachers' Certificates issued after probation during the same period.

YEAR.	MALES.				FEMALES.				GRAND TOTAL.	Number of Teachers' Certificates issued after probation (Art. 51 of Code.)		
	Trained Teachers.	Untrained Teachers.		TOTAL.	Trained Teachers.	Untrained Teachers.		TOTAL.		Males.	Females.	TOTAL.
		Acting Teachers.	Graduates.			Acting Teachers	Graduates.					
1898	115	2	32	149	372	200	2	574	723	146	524	670
1899	160	1	32	193	342	215	8	565	758	114	537	651
1900	170	7	29	206	412	340	13	765	971	114	513	627
1901	165	3	29	197	380	314	12	706	903	130	564	694
1902	207	13	19	239	498	307	10	815	1,054	161	674	835
1903	126	8	30	164	454	376	13	843	1,007	164	689	853
1904	185	9	27	221	526	505	22	1,053	1,274	208	752	960
1905	177	6	20	203	532	395	38	965	1,168	197	825	1,022
1906	158	8	35	201	588	549	45	1,182	1,383	†148	†705	†853
1907	209	21	34	264	638	630	29	1,297	1,561	213	1,047	1,260
Total for 10 years.	1,672	78	287	2,037	4,742	3,831	192	8,765	10,802	1,595	6,830	8,425

† These figures relate to *Six months* only.

TABLE 8.

TABLE OF GRANTS for the Further Instruction of Teachers paid under Article 66 of the Regulations for the year ended 31st July, 1907.

Provincial Committee.	Total Expenditure on Courses (Article 55).			Three-fourths Grant paid (Article 66).			Contribution from General Aid Grant (Article 66).			Paid from balance in hands of Committee under Article 63.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Aberdeen	285	15	10	214	6	10	–	–	–	71	9	0
Edinburgh	722	18	1	542	3	7	180	14	6	–	–	–
Glasgow	2,616	1	5	1,962	1	1	–	–	–	654	0	4
St. Andrews	370	14	1	503	0	6	32	14	3	134	19	4
Totals	4,295	9	5	3,221	12	0	213	8	9	860	8	8

TABLE 9.

(*a*) LIST of COURSES for the further instruction of Certificated and Assistant Teachers sanctioned by the Scotch Education Department, under Article 91 (*d*) of the Code of 1906 from 1st April, 1906, to July, 1906.

No. of Course.	Date when sanctioned.	Managers.	Session.	Where held.	Subject.	No. of hours Instruction.	No. of Students	No. of Certificates of satisfactory attendance and progress authorised.	Amount of Grant paid equal to three-fourths of approved expenditure.		
									£	s.	d.
690	18th April, 1906.	Glasgow School Board.	1906	Glasgow.	Physical Training.	33	63	51	34	16	4
691	1st May, ,,	Forfar Burgh School Board.	,,	Forfar.	Nature Knowledge.	60	25	16	21	7	1
692	18th May, ,,	Inverness County Committee.	,,	Inverness.	Physical Training.	10½	138	—	17	17	4
†693	16th June, ,,	Marine Biological Association of the West of Scotland.	,,	Millport.	Nature Knowledge.	60	35	35	92	12	—
†697	10th July, ,,	Fife County Committee.	,,	Dunfermline.	Woodwork.	82½	13	13	16	2	6
†698	10th July, ,,	Ditto.	,,	St. Andrews.	Drawing.	80	67	67	63	7	6
Totals. 6	—	—	—	—	—	—	341	182	246	2	9

† Holiday Course.

TABLE 9—*continued.*

(*b*) LIST OF COURSES for the further instruction of Teachers in actual service sanctioned by the Scotch Education Department under Article 55 of the Regulations for the Preliminary Education &c. of Teachers, 1906–7.

No. of Course.	Where held.	Managers.	Subject.	Duration.	No. of hours of instruction	No. of Students.	
						Enrolled.	Who satisfactorily completed.
		ABERDEEN PROVINCIAL COMMITTEE.					
1.A.	Aberdeen	Provincial Committee	Physical Exercises	July 1906 to Aug. 1906	40	12	4
2.A.	,,	,, ,,	Anatomy, Physiology, &c.	,, ,,	40	16	3
3.A.	Fraserburgh	Fraserburgh School Board	Drawing and Modelling	Oct. 1906 to April 1907	75	15	13
4.A.	Inverness	Inverness Free Library Committee	Drawing	,, ,,	98	22	19
5.A.	Peterhead	Peterhead School Board	,,	Oct. 1906 to May 1907	54	15	13
6.A.	Elgin	Elgin County Committee	,,	Nov. 1906 to April 1907	63	27	20
7.A.	Maud	Aberdeen County Committee	French	Dec. 1906 to July 1907	60	20	11
8.A.	Maud	Aberdeen County Committee	German	,, ,,	60	18	11
		EDINBURGH PROVINCIAL COMMITTEE.					
1.E.	Edinburgh	Edinburgh School Board	Physical Exercises	Sept. 1906 to May 1907	36	101	82
2.E.	,,	,, ,, ,,	Drawing	,, ,,	60	102	84
3.E.	Hawick	Hawick School Board	Physical Training	Oct. 1906 to May 1907	42	32	25
4.E.	Galashiels	Galashiels School Board	,, ,,	,, ,,	42	50	36
5.E.	Duns	Managers of Berwickshire High School	,, ,,	Oct. 1906 to June 1907	42	41	34
6.E.	Stirling	Stirling (B.), School Board	Woodwork	Dec. 1906 to May 1907	60	20	15
7.E.	,,	,, ,, ,, ,,	Drawing and Modelling	,, ,,	60	45	33
8.E.	Leith	Leith School Board	Drawing	Oct. 1906 to May 1907	65	48	37
9.E.	,,	,, ,, ,,	Nature Knowledge	,, ,, June 1908		21	

TABLE 9.—*continued*

No of Course.	Where held.	Managers.	Subject.	Duration.	No. of hours of instruction	No. of Students	
						Enrolled	Who satisfactorily completed
			EDINBURGH PROVINCIAL COMMITTEE—*continued.*				
10.E.	Bo'ness	Linlithgow Education Committee	Physical Training	Oct. 1906 to Mar. 1907	30	39	37
11.E.	Linlithgow	,, ,,	,, ,,	,, ,,	30	23	17
12.E.	Leith	Leith School Board	Physics	Oct. 1906 to May 1907	65	20	13
13.E.	Stirling	Stirling School Board	French	Dec. 1906 to May 1907	40	17	6
14.E.	,,	,, ,, ,,	German	,, ,,	40	14	3
15.E.	Leith	Leith School Board	Physical Exercises	Oct. 1906 to Jan. 1907	12	30	21
16.E.	Edinburgh	Edinburgh R.C. Managers	Physical Exercises	Oct. 1906 to May 1907	30	35	23
			GLASGOW PROVINCIAL COMMITTEE.				
1.G.	Dumbarton	Dumbarton School Board	Drawing	Sept. 1906 to April 1907	60	13	13
2.G.	Glasgow (Adelphi Terrace P. School)	Glasgow School Board	,,	Oct. 1906 to April 1907	60½	32	18
3.G.	Glasgow (High School)	,, ,, ,,	,,	Sept. 1906 to Mar. 1907	60	77	51
4.G.	Glasgow (Provanside P. School)	,, ,, ,,	Cardboard Modelling	Sept. 1906 to April 1907	30	40	30
5.G.	,,	,, ,, ,,	Clay Modelling	,, ,,	30	36	24
6.G.	Glasgow (Pupil Teachers' Institute)	,, ,, ,,	Drawing	Oct. 1906 to April 1907	60½	133	113
7.G.	Glasgow (Whitehill P. School)	,, ,, ,,	,,	Sept. 1906 to Mar. 1907	60	23	16
8.G.	Airdrie	Airdrie School Board	,, (1st year)	Oct. 1906 to April 1907	65	20	14
9.G.	,,	,, ,, ,,	Drawing (2nd and 3rd Years)	Oct. 1906 to April 1907	65	29	27

TABLE 9.—*continued.*

No. of Course.	Where held.	Managers.	Subject.	Duration.	No. of hours of instruction	No. of Students.	
						Enrolled.	Who satisfactorily completed.
			GLASGOW PROVINCIAL COMMITTEE—*continued.*				
10.G.	Glasgow (R.C. Training College)	Managers of Training College	French	Sept. 1906 to April 1907	66	21	7
11.G.	Hamilton	Hamilton (B) School Board	Physical Training	Oct. 1906 to March 1907	24	36	32
12.G.	,,	,,	Art Needlework and Drawing	Sept. 1906 to May 1907	60	35	15
13.G.	,,	,,	Drawing and Modelling (3rd Year)	Oct. 1906 to April 1907	60	15	12
14.G.	,,	,,	Drawing (2nd Year)	Oct. 1906 to April 1907	60	17	14
15.G.	,,	,,	Drawing (1st Year)	Oct. 1906 to March 1907	48	16	16
16.G.	,,	,,	Woodwork and Cardboard Modelling	Oct. 1906 to April 1907	48	22	20
17.G.	,,	,,	Physical Science	Oct. 1906 to March 1907	60	13	9
18.G.	Lanark	Lanark School Board	Drawing (1st and 2nd Year)	Oct. 1906 to April 1907	60	19	11
19.G.	Glasgow (High School for Girls)	Glasgow School Board	Physical Training	Oct. 1906 to May 1907	34	161	103
20.G.	,,	,,	,,	Oct. 1906 to June 1907	30	208	107
21.G.	Glasgow (Woodside P. School)	,,	Chemistry	Sept. 1906 to May 1907	84	20	14
22.G.	Paisley	Governors of Paisley Technical School	Drawing and Modelling	Nov. 1906 to May 1907	112½	14	12
23.G.	,,	Managers of Paisley St. Margaret's Convent	Drawing (2nd Year)	Oct. 1906 to April 1907	72	20	13
24.G.	,,	,,	Drawing (1st Year)	,,	72	29	21
25.G.	,,	,,	Practical Physics (1st Year)	,,	62½	22	16
26.G.	,,	,,	Practical Physics (2nd Year)	,,	60	19	16

TABLE 9.—*continued.*

No. of Course.	Where held.	Managers.	Subject.	Duration.	No. of hours of instruction	No. of Students	
						Enrolled.	Who satisfactorily completed.
			GLASGOW PROVINCIAL COMMITTEE—*continued.*				
27.G.	Glasgow (R.C. Training College)	Managers of Training College	Experimental Science - -	Sept. 1906 to Feb. 1907	62	42	34
28.G.	Glasgow (Our Lady and St. Francis H.G. R.C. Sch'l	Glasgow R.C. Committee -	Practical Science- - -	Oct. 1906 to May 1907	60	62	35
29.G.	,, ,,	,, ,,	Drawing - - - -	Oct. 1906 to Mar. 1907	60	42	34
30.G.	Maryhill - - -	Maryhill School Board -	Physical Exercises - -	Dec. 1906 to Feb. 1907	31	51	33
31.G.	Govan - - - -	Governors of Anderson's College	Chemistry - - - -	Oct. 1906 to May 1907	92½	21	15
32.G.	Glasgow (School of Art)	Governors of School - -	Drawing, &c. (2nd Year) -	Oct. 1906 to April 1907	60	163	125
33.G.	,, ,,	,, ,, - -	Drawing, &c. (3rd Year) -	,, ,,	60	366	210
34.G.	Kilmarnock - - -	Kilmarnock School Board -	Drawing - - - -	Oct. 1906 to Mar. 1907	60	16	14
35.G.	Glasgow (School of Art)	Governors of School - -	Drawing - - - -	Dec. 1906 to Feb. 1907	54	31	31
36.G.	Ayr - - - -	Ayr School Board - -	,, - - - -	Oct. 1906 to Mar. 1907	60	62	42
37.G.	,, - - - -	,, ,, - -	French - - - -	,, ,,	60	36	17
38.G.	Campbeltown - -	Campbeltown School Board	,, - - - -	Nov. 1906 to June 1907	60	21	
39.G.	Govan - - - -	Govan School Board - -	German - - - -	,, ,,	60	30	
40.G.	,, - - - -	,, ,, - -	Drawing - - - -	,, ,,	60	13	10
41.G.	Glasgow - - -	Glasgow R.C. Committee -	Physical Exercises - -	Oct. 1906 to May 1907	23	145	79

TABLE 9.—*continued.*

No. of Course.	Where held.	Managers.	Subject.	Duration.	No. of hours of instruction	No. of Students.	
						Enrolled.	Who satisfactorily completed.
			ST. ANDREWS PROVINCIAL COMMITTEE.				
1.S.	Dundee	Provincial Committee	Physical Training	Dec. 1906 to May 1907	25	65	52
2.S.	Thornton	Fife County Committee	French	Nov. 1906 to June 1907	56	28	5
3.S.	Dundee	Dundee School Board	Physical Training	Nov. 1906 to Jan. 1907	9	57	52
4.S.	Dunfermline	Fife County Committee	,, ,,	Nov. 1906 to June 1907	50	37	28
5.S.	Dundee	Dundee School Board	Woodwork	Nov. 1906 to May 1907	60	21	21
6.S.	,,	,, ,, ,,	Paper and Cardboard Modelling	Nov. 1906 to Jan. 1907	10	93	92
7.S.	Kirkcaldy	Fife County Committee	Phonetics	Jan. 1907 to June 1907	30	31	24
8.S.	Thornton	,, ,, ,,	Mathematics	Nov. 1906 to June 1907	56	24	10
9.S.	Dundee Technical Institute	Provincial Committee	Phonetics	Jan. 1907 to April 1907	14	33	21
10.S.	Perth	Perth School Board	Drill (2nd year)	Oct. 1906 to Dec. 1907	30	28	17
11.S.	,,	,, ,, ,,	Physics	Oct. 1906 to April 1907	60	9	8
12.S.	,,	,, ,, ,,	Drawing (2nd year)	Oct. 1906 to April 1907	60	21	18
13.S.	,,	,, ,, ,,	,, (1st Year)	Oct. 1906 to April 1907	60	18	16
14.S.	,,	,, ,, ,,	French	Oct. 1906 to June 1907	108	15	15
15.S.	,,	,, ,, ,,	German	Oct. 1906 to June 1907	114	17	16
16.S.	,,	,, ,, ,,	Cookery	Oct. 1906 to April 1907	60	18	12
17.S.	,,	,, ,, ,,	Drill	Jan. 1907 to April 1907	30	31	12
Totals 82	—	—	—	—	—	3,520	2,402*

* Excluding the figures for 3 courses not yet reported upon.

Table 10.

Summary of Table 9 and of similar Tables for previous years under Subjects.

Subject	1899–1901.		1901–1902.		1902–1903.		1903–1904.		1904–1905.		1905–1906.		1906–1907.	
	No. of Courses.	No. of Students who completed course satisfactorily.	No. of Courses.	No. of Students who completed course satisfactorily.	No. of Courses.	No. of Students who completed course satisfactorily.	No. of Courses.	No. of Students who completed course satisfactorily.	No. of Courses.	No. of Students who completed course satisfactorily.	No. of Courses.	No. of Students who completed course satisfactorily.	No. of Courses.	No. of Students who completed course satisfactorily.
Domestic Subjects	1	6	2	31	5	59	2	27	3	44	1	13	1	12
Drawing	33	1,242	65	2,638	92	3,330	72	2,304	45	1,236	36	1,006	32	1,152
Educational Handwork, viz.:—														
Cardboard Modelling	3	34	6	181	3	60	–	–	1	19	–	–	2	122
Clay Modelling	–	–	4	103	1	17	–	–	–	–	–	–	1	24
Woodwork	6	139	9	151	6	62	6	71	7	99	7	75	4	69
Land Surveying	–	–	–	–	–	–	1	11	–	–	–	–	–	–
Mathematics	–	–	–	–	–	–	–	–	–	–	–	–	1	10
Modern Languages, viz.:—														
French	2	15	3	18	5	25	6	62	7	125	8	127	7	61
German	2	7	2	13	1	4	2	14	2	22	3	46	4	30
Nature Study, viz.:—														
Natural Science (Botany, Zoology, &c.)	7	151	22	454	18	293	20	274	9	110	4	66	3	51
Physical Science (Physics, Chemistry, &c.)	10	144	11	114	11	109	16	188	10	179	8	150	9	160
Physical Exercises	4	154	6	257	8	176	8	391	11	332	11	583	22	848
Phonetics	–	–	–	–	–	–	–	–	–	–	1	8	2	45
School and Personal Hygiene	–	–	–	–	–	–	1	51	1	70	1	13	–	–
Totals	68	1,892	130	3,960	150	4,135	134	3,393	96	2,236	80	2,087	88	2,584
Total Grants paid	£2,655		£4,709		£5,099		£4,812		£3,143		£2,718		£3,468	

TABLE 11.

KING'S SCHOLARSHIP EXAMINATION, DECEMBER, 1906.

Summary of Results of Examination.

MALES.

	Pupil Teachers.	Non-Pupil Teachers.	Total.
Passed :—1st Class	7	3	10
2nd Class	27	12	39
3rd Class	55	25	80
Total :—Passed	89	40	129
Failed	11	18	29
Total presented	100	58	158
Qualified under Articles 70 (*d*) 6 (*a*), 70 (*d*) 6 (*b*), 95 (*a*) 2, 95 (*a*) 3, 96 (*a*) or 96 (*b*). of the Code.	120	87	207

FEMALES.

	Pupil Teachers.	Non-Pupil Teachers.	Total.
Passed :—1st Class	185	31	216
2nd Class	262	40	302
3rd Class	409	100	509
Total :—Passed	856	171	1,027
Failed	117	103	220
Total presented	973	274	1,247
Qualified under Articles 70 (*d*) 6 (*a*), 70 (*d*) 6 (b), 95 (*a*) 2, 95 (*a*) 3, 96 (*a*) or 96 (*b*). of the Code.	324	157	481

TABLE 12.

CERTIFICATE EXAMINATION, JULY, 1907.

Summary of Results of Examination of Graduates and Teachers.

GRADUATES.

Examined under Article 72 (*c*) of the Regulations for the Preliminary Education, &c., of Teachers.

	Number Examined.	Passed.	Failed.
Males	30	29	1
Females	15	15	—
Totals	45	44	1

Exempted under Article 72 (*c*). of the Regulations for the Preliminary Education, &c., of Teachers.

Males	5
Females	14
Total	19

TEACHERS.

	Number Examined.	Passed.	Recognised under Article 72 (*f*) of the Regulations.	Failed.
Males	43	21	17	5
Females	1,071	630	397	44
Totals	1,114	651	414	49

SCOTCH EDUCATION DEPARTMENT,
WHITEHALL, LONDON.

King's Scholarship Examination.

December 1908.

REGULATIONS AND SYLLABUS

RELATING TO THE

EXAMINATION OF PUPIL TEACHERS

FOR

ADMISSION AS STUDENTS IN FULL TRAINING,

AND OF CANDIDATES FOR THE OFFICE OF

ASSISTANT TEACHER.

NOTICE.

THE KING'S SCHOLARSHIP EXAMINATION WILL BE DISCONTINUED AFTER THE EXAMINATION HELD IN DECEMBER, 1908.

This examination is held primarily to meet the cases of PUPIL-TEACHERS for whom it has not been found possible to arrange for a curriculum of instruction which can be approved in terms of Article 69 of the Regulations for the Training of Teachers, and who have accordingly obtained the special permission of the Department to terminate their engagements in terms of the Second paragraph of the note to that Article. The Examination will also be open to any Candidates who were qualified to attend the King's Scholarship Examination AS PUPIL-TEACHERS in previous years, to TEACHERS RECOGNISED UNDER ARTICLES 32 (c) 3 and 19 D (a) OF THE CODE of 1906, and to any Candidates who received permission to attend the King's Scholarship Examination in any former year.

Persons who are eligible to attend this Examination may also qualify for exemption therefrom in terms of Article 70 (d) 6 of the Code of 1906.

SCOTCH EDUCATION DEPARTMENT.

KING'S SCHOLARSHIP EXAMINATION, 1908.

IMPORTANT.

The attention of Candidates for the King's Scholarship Examination to be held in December, 1908, is called to the terms of *Article 73 (b) 1 and 2 of the Regulations for the Training of Teachers, from which it will be seen that it is only in the case of Candidates who have been Pupil-teachers that a pass at this examination will qualify for immediate admission into full training. Successful candidates, other than Pupil-teachers, will be recognised as Assistant Teachers under Article 79 of the Code of 1906, and must serve for a period of not less than 12 months in that capacity in order to qualify for admission into training in terms of *Article 73 (b) 4 of the Regulations.

REGULATIONS.

1. The Examination will commence on Tuesday, 15th of December, 1908, and will be held at the following Centres :—

ABERDEEN.	ELGIN.	OBAN.
AYR.	GLASGOW.	PAISLEY.
DALIBURGH.	GREENOCK.	PERTH.
DUMFRIES.	INVERNESS.	PORTREE.
DUNDEE.	KIRKWALL.	STIRLING.
DUNFERMLINE.	LERWICK.	STORNOWAY.
EDINBURGH.	MOTHERWELL.	WICK.

and also at the Scottish Episcopal Training College, Edinburgh, and the Roman Catholic Training College, Glasgow.

2. The Examination extends to the subjects required in the course of a Pupil-teacher's engagement and mentioned in the Syllabus appended hereto.

3. Candidates must be either Pupil-teachers entering for their final examination under the note to Article 69 of the Regulations for the Training of Teachers, or other persons over 18 years of age on the 1st of October next following the date of the Examination who come within the terms of the notice printed on page 2 of this Syllabus. The names of all Candidates must be notified to the Department before the 1st October, 1908.

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* *Articles of the Regulations referred to above :—*

73 (b) **In any year up to and including 1914** there may be admitted as Students in Full Training :—

1. Pupil Teachers who have passed the King's Scholarship Examination (1st, 2nd or 3rd Class) or who have obtained exemption therefrom in terms of Article 70 (d) (6) of the Code of 1906.

2. Persons other than Pupil Teachers who have passed the King's Scholarship Examination in the 1st or 2nd Class at the Examination held in 1906 or any previous year.

* * * *

4. Persons who have served in State-aided Schools in Scotland for not less than twelve months as Assistant Teachers (Article 79 of the Code of 1906), or as Provisionally Certificated Teachers (Article 60 of the Code of 1906).

4. Application on behalf of Pupil-teachers and others engaged in State-aided Schools for permission to attend the Examination must be made on Form 146 by the official correspondent of the school in which they are engaged. A copy of this Form will be sent to the managers of any State-aided School on application.

5. Pupil-teachers or ex-Pupil-teachers employed in State-aided Schools must receive a report from the managers of their schools as to their physical fitness for the profession of teacher. This report should be made on the Form 10 P.T. or 9 (or 9*b*) for the School.

6. Candidates other than those referred to in paragraph 4 above must apply by letter to the Department for permission to attend the Examination, giving their name *in full* and the exact date of their birth, and stating their qualification for admission to the Examination.

7. Non-Pupil-teachers, in order to obtain marks for Reading, Repetition, and Teaching, must communicate with H.M. Inspector for the district, whose report will be made on Form 13 [C]; and they must obtain from a duly qualified medical practitioner a satisfactory report on their physical fitness, which must be made on Form 42.

(Forms 13 [C] and 42 will be enclosed with the Form 13 admitting the Candidate to the Examination.)

8. Candidates wishing to be examined at either of the two Training Colleges (*see page* 73) must make their own arrangements with the authorities of such College for securing a seat. To other Candidates a choice of Centres is offered (*see page* 73).

9. Candidates will be informed by letter from the Department as to the result of their Examination. Pupil-teacher Candidates who obtain a place in the First, Second or Third Class will be eligible for admission as Students in Full Training. For information as to the qualifications of successful Candidates as Assistant Teachers, *see* Articles 79 of the Scotch Code, 1906, 32 (*c*) 2 of the Code of 1907, and Article 71 (*b*) and (*c*) of the Regulations for the Training of Teachers. Special attention is also directed to Article 71 (*d*) of the Regulations.

10. The position in the Class List of any Candidates entitled to exemption under the last paragraph of the notice printed on page 2 of this Syllabus, who elect to undergo the Examination, will depend upon the result of such examination.

11. Under no circumstances can information be afforded by the Department as to the result of the Examination in particular subjects.

Candidates are recommended to make themselves acquainted with the Regulations for the Training of Teachers.

Copies of the papers set at previous Examinations (price 6*d.*, post free 7*d.*), of the Scotch Code (price 3*d.*, post free 4*d.*) and of the Regulations for the Training of Teachers (price 3½*d.*, post free 4½*d.*) may be obtained from Messrs. Wyman & Sons, Limited, Fetter Lane, London, E.C., and 32, Abingdon Street, Westminster, S.W.; or Oliver and Boyd, Edinburgh; or E. Ponsonby, 116, Grafton Street, Dublin, or through any bookseller.

SYLLABUS OF SUBJECTS OF EXAMINATION.

A.—COMPULSORY SUBJECTS.

Reading and Repetition. *[30]—To read with fluency, ease, and just expression, and to repeat 100 lines of Shakespeare, Milton, or Tennyson with clearness and force, and knowledge of meanings and allusions.

Teaching. [60]—To give a collective or class lesson on any subject taught in State-aided Schools. (An object lesson may be required.)

To prepare notes for any such lesson.

To answer questions as to the mode of giving any such lesson.

N.B.—Pupil-teachers and others engaged in State-aided Schools perform the exercises in Reading, Repetition and Teaching before H.M. Inspector at one of his visits to their school preceding the King's Scholarship Examination or elsewhere as he may arrange. Other Candidates, by giving notice to the Inspector of the district, will have an opportunity of Reading, Repeating, and Teaching before him at some school of which he will give them notice.

Penmanship [30] and Dictation. [30]

1. To write a specimen of the penmanship used in setting copies of text hand and small hand.

2. To write a passage from dictation.

Candidates should write a firm, round, legible hand.

English [60] and Composition. [20]

To paraphrase a passage either of prose or poetry.

Parsing, and analysis of simple and complex sentences.

Knowledge of roots, prefixes and terminations, both Latin and English.

A knowledge of the sources and growth of the English language and literature.

To write an original composition on a given subject.

Geography. [50]—Physical, political and commercial geography of the World, with special reference to the British Isles and British Possessions.

Answers may be required to be illustrated by sketch maps.

History. [50]—British History from Julius Cæsar to the present time, with a special reference to Scottish History.

Note.—All Candidates will be required to pass in the subjects of Geography and History. Those Candidates who, at this Examination, fail to obtain at least 40 per cent. of the maximum number of marks for Geography and History combined, will be held to have failed in the Examination, and will be so informed.

Candidates who pass the King's Scholarship Examination will understand that they are thereby necessarily qualified in Geography and History for the purposes of the Certificate Examination for Acting Teachers.

* The figures in brackets indicate the maximum number of marks allowed for each subject.

***Mathematics.** *Females.* [**90**] (*See Note to Mathematics for Males which applies equally to Female Candidates.*)

One paper will be set on the Lower Grade Syllabus of the Leaving Certificate Examination, viz. :—

ARITHMETIC. The elementary rules; prime factors of numbers; weights and measures in common use; the metric system; vulgar and decimal fractions; elementary methods of approximate calculation by decimals; practical problems. The intelligent use of algebraical symbols is permitted, and no question will be set on recurring decimals.

ALGEBRA. Numerical interpretation of formulæ; simple algebraical transformations; the graphical representation of simple functions; equations of the first degree in one and two variables; easy quadratic equations; problems leading to the above equations.

GEOMETRY. The main propositions given in Euclid, Books I and III, with deductions and constructions arising from them; simple loci; application of arithmetic and algebra to geometrical theorems and problems. Elementary drawing to scale. Proofs will be accepted which appear to form part of a logical treatment of the subject.

*NOTE.—*Female Candidates may take the papers on Mathematics set for Males (in place of that for Females), and receive the extra marks therefor.*

Mathematics. *Males.*

Two papers [**90** each] will be set on the Higher Grade Syllabus of the Leaving Certificate Examination, viz. :—

ALGEBRA. The subjects of the Lower Grade; more difficult transformations, equations, and problems; application of graphical methods; elementary theory of indices including logarithms; surds; the remainder theorem; ratio; proportion; progressions, arithmetical questions will also be set, including questions on theory and exercises involving the practical use of logarithms.

GEOMETRY. The main propositions in Euclid, Books I-VI and XI., 1-21, with deductions and constructions arising from them, but excluding the theory of incommensurable quantities; the elementary properties of simple plane-faced solids; mensuration of plane and solid figures; approximate solutions by drawing to scale. Proofs will be accepted which appear to form part of a logical treatment of the subject.

TRIGONOMETRY. Elementary Trigonometry, including the solution of triangles, with the aid of four-place logarithms. Graphical solutions of problems.

NOTE.—*All candidates must bring instruments to the Examination for correct drawing and measurement, viz., a ruler graduated in inches and tenths on one side, and in centimetres and millimetres on the other; a protractor graduated in degrees; set squares; and compasses.*

School Management. [**75**]—Notes of lessons.

The methods of teaching the ordinary subjects.

The methods and principles of infant teaching and discipline, and of cultivating the intelligence of children.

Needlework. *Females.* [**80**]—1. The various stitches used in making and mending calico and flannel underclothing.

2. The cutting out, by proportion or by measurements, of a girl's chemise, night-dress and gored petticoat.

3. The knitting of a boy's sock or girl's stocking.

Domestic Economy. *Females.* [**45**]—Food; its composition functions and preparation.

Clothing and washing.

Rules for warming, cleaning and ventilating the dwelling.

Rules for preserving health.

The management of a sick room.

The feeding and management of infants and young children

B.—OPTIONAL SUBJECTS.

Candidates will be allowed marks for the following optional subjects :—

MUSIC.

ONE LANGUAGE (or *two* languages if no marks are claimed for Science).

SCIENCE.

DRAWING.

Music.—Candidates may take theory without also taking the tests in practical skill.

(*a.*) THEORY. [**20**]

Staff Notation :

All the major and minor scales and signatures. Intervals, diatonic and chromatic. Easy transposition. Time signatures. Values of notes and rests. Contents of bars. Transcription. Syncopation. Voice training of children. Common musical terms. Translation of a short passage into Sol-fa Notation.

AND

Tonic Sol-fa Notation :

The major and minor modes. First remove changes of key. Bridge notes. Chromatic notes. Intervals, diatonic and chromatic. Pulses, common divisions of pulses. Measures. Transcription, by doubling or halving, &c. Syncopation. Translation of a short passage into Staff Notation.

(*b.*) PRACTICAL SKILL. [**30**]

The tests can be sung from the staff or the tonic sol-fa notation (or both) at the option of the Candidate.

Graded tests in tune, time, and ear training. The highest marks will be given to candidates able to sing at sight passages in both notations combining time and tune, and to tell ear exercises freely.

Languages. [**80 each**]—Grammatical questions and passages for translation from English into the language chosen, and into English from the following books :—

LATIN.—Cicero, *de Senectute*, and Virgil, *Æneid*, Book II., and simple unseen passages.

GREEK.—Xenophon, *Anabasis*, Books III. and IV., and Homer, *Iliad*, Book III., and simple unseen passages.

FRENCH.—Simple unseen passages.

GERMAN.—Simple unseen passages. A few additional marks will be allowed for the use of German Script.

NOTE.—*Candidates who fail to make at least 25 per cent. of the maximum for any Language will not be credited with any marks therefor.*

Science [80] and Drawing. [60]—To obtain marks for Science or Drawing Candidates must have attended a three years course (*see* however, next paragraph) under a scheme previously approved by the Department for this purpose, and be presented at the Leaving Certificate Examination in the subject in 1908, when marks will be awarded according to the merit of their work, even though a pass may not have been obtained

Pupil Teacher Candidates who, for good reason shown, have not been able to complete a full three years course either in Science or Drawing, will be allowed marks on a lower scale, provided that at least one year of the approved course has been satisfactorily overtaken, and that the Candidates are duly presented as above.

Application to attend the Leaving Certificate Examination for the purpose of obtaining marks in Science or Drawing for the King's Scholarship Examination must be made through the Managers of the schools or classes in which Candidates are receiving instruction. Such applications should reach the Department *not later than 15th January, 1908.* The Department cannot guarantee that any application received after that date will be complied with.

Candidates who have been presented in Science or Drawing at any Leaving Certificate Examination previous to 1908 may be credited with the marks then awarded for their work. But any such candidates who have already obtained a pass in Science or Drawing at the Leaving Certificate Examination, by continuing their study of these subjects, and being duly presented in accordance with the above regulations at the Leaving Certificate Examination in 1908, may be awarded marks up to a maximum of 90 in the case of Science, and 80 in the case of Drawing.

Detailed regulations applicable to the Leaving Certificate Examination in Science and Drawing will be found in Circulars No 368 and 367 respectively, copies of which may be had on application to the Department.

C.—SPECIAL SUBJECT.

Gaelic. [80]—In addition to the marks obtainable under the foregoing regulations, marks will be allowed for Gaelic :—

(1.) To candidates who are, or who have been Pupil-teachers in any of the counties mentioned in Article 19 E. Scotch Code of 1906, and

(2.) To candidates who, not having been Pupil-teachers, are shown to the satisfaction of the Department to have been under tuition at some centre of instruction within the specified counties for at least one year immediately preceding the King's Scholarship Examination.

All candidates must fulfil the following conditions :—

They must be presented at the Leaving Certificate Examination in Gaelic in April, 1908.

Marks will then be awarded according to the merit of their work, whether they be successful at the Leaving Certificate Examination or not.

Application to attend the Leaving Certificate Examination for this purpose must be made by the managers of the Schools, or other centres of instruction, at which the candidates have been in attendance, and should reach the Department *not later than 7th January, 1908.* The Department cannot guarantee that any application received after that date will be complied with.

Candidates who have been presented in Gaelic at any Leaving Certificate Examination previous to 1908, may be credited with the marks then awarded, or may again present themselves for Examination with a view to obtaining additional marks (within the maximum of80).

Full particulars as to the scope and character of the Leaving Certificate Examination in Gaelic will be found in Circular No. 383, copies of which may be had on application to the Department.

Candidates should follow the orthography of the dictionaries of Macleod and Dewar, or of Maceachan.

SCOTCH EDUCATION DEPARTMENT.

WHITEHALL, LONDON.

EXAMINATION FOR TEACHERS' CERTIFICATES.

July, 1908.

REGULATIONS AND SYLLABUS

RELATING TO THE

EXAMINATION OF ACTING TEACHERS.

The Examination will commence on Tuesday, the 7th July, 1908, at 9.30 a.m.

SCOTCH EDUCATION DEPARTMENT.

CERTIFICATE EXAMINATION, 1908.

REGULATIONS.

1. The Examination of Acting Teachers for Certificates will be held on Tuesday, 7th July, 1908, and three following days at the following centres:—

ABERDEEN.	GLASGOW.	PAISLEY.
AYR.	GREENOCK.	PERTH.
DUMFRIES.	INVERNESS.	PORTREE (*if a sufficient number of candidates apply*).
DUNDEE.	KIRKWALL.	
DUNFERMLINE.	LERWICK.	STIRLING.
EDINBURGH.	MOTHERWELL.	STORNOWAY.
ELGIN.	OBAN.	WICK.

2. The examination is open to candidates who are upwards of 20 years of age on the 1st October next following the date of the Examination, and have either:—

(1). Been employed for not less than one year as Provisionally Certificated Teachers (Article 60 of the Code of 1906), *or*—

(2). Served as Assistant Teachers (Article 79 of the Code of 1906), for at least twelve months in day schools approved by the Department, under Certificated Teachers.

The Examination is also open to Graduates in Arts or Science of any University of the United Kingdom *who graduated in or before the year 1906*, and who after a course of training for not less than six months, in a day school approved by the Department, satisfy the Inspector of their practical skill as teachers.

3. The names of all candidates must be notified to the Department before the 1st of May, on Form 147, by the Managers of the Schools in which they are serving (or in which they last served). A copy of Form 147 will be sent to the Managers of every State-aided School in or about the month of October, 1907.

4. Under the School Teachers' Superannuation Rules (Scotland) 1899, every candidate desirous of being examined whether previously so examined or not, must forward to the Department satisfactory evidence of physical capacity and age. A list of the Medical Officers nominated by the Department, together with a form of medical certificate, will be sent to each candidate on or about 31st March. The medical examination must take place between 1st April and 1st June, in the year in which the Examination is to be taken. The fee for the medical examination, *not exceeding* ten shillings and sixpence, is payable by the candidate.

The evidence of age must be produced by means of the Certificate of a Registrar of Births and Deaths, and should be forwarded to the Department with the Form 147, unless it has been produced in connexion with a previous examination.

5. The subjects of examination are laid down in the following Syllabus, and are open to candidates of either sex unless otherwise specified. Candidates are no longer required to pass two examinations. There will be one set of papers only, the general standard of which will be that of second year's papers at former examinations. (See Article 72 (a) of the Regulations for the Preliminary Education, Training, &c., of Teachers).

6. The maximum number of marks allowed for each subject is indicated by the figures within brackets [ ].

7. Candidates who do not obtain at least 25 per cent. of the maximum for ENGLISH and COMPOSITION, PENMANSHIP, SPELLING, and TEACHING, will be held to have failed in the examination. These subjects are distinguished in the Syllabus by the letter (f).

8. Candidates will be informed by letter from the Department of the result of their examination.

Successful candidates will be recognised as Certificated Teachers from the first day of the month succeeding the date of the examination and, upon the fulfilment of the conditions as to probation laid down in Articles 49 and 50 of the Regulations for the Preliminary Education, Training, &c., of Teachers, will be awarded certificates which will be of one class only, and will be held subject to the provisions of Article 54 of those Regulations.

Unsuccessful candidates may, nevertheless, if their performance at the examination warrants such a course, be recognised by the Department as having obtained the equivalent, for the purposes of Article 73 (*c*) of the Regulations for the Preliminary Education, Training, &c., of Teachers, of a pass in first year's papers.

9. Under no circumstances can information be afforded as to the result of the examination in particular subjects.

Candidates are recommended to make themselves acquainted with the Regulations for the Preliminary Education, Training, and Certification of Teachers.

Copies of those Regulations, price 3½*d.*, post free 4½*d.*, and of the papers set at the previous Certificate Examinations, price 6*d.*, post free 7*d.*, can be obtained, either directly or through any Bookseller, from Wyman and Sons, Ltd., Fetter Lane, London, E.C., and 32, Abingdon Street, Westminster, S.W.; or Oliver and Boyd, Edinburgh; or E. Ponsonby, 116, Grafton Street, Dublin.

1908.

SYLLABUS.

1. OBLIGATORY SUBJECTS.

Teaching, Practical Skill in (f).

Candidates are required to teach a class in the presence of H.M. Inspector at his visit to their school next before the Certificate Examination.

Penmanship (f) [50] and Dictation (f) [50].

1. To write a specimen of the penmanship used in setting copies of text hand and small hand.

NOTE.—Pupils should be taught to write a firm, round, legible hand.

2. To write a passage from dictation.

English (f) [100] and Composition (f) [50].

1. An intelligent acquaintance with the language, style, and subject-matter of *Shakespeare's* "*A Midsummer Night's Dream*," and the first three chapters of *Gibbon's* "*Decline and Fall of the Roman Empire.*"

(In 1909 the books will be *Shakespeare's* "*As you like it*," and *Carlyle's* "*Essay on Burns.*")

2. To write plain prose upon a given subject.

3. General knowledge of English literature in the eighteenth century.

(In 1909 the prescribed period will be *from 1800 to 1850.*)

School Management [100].

1. The training of the faculties of sense, memory, judgment, and reasoning; the order of their development and the mental processes they involve; the formation of habits and character.

2. The best methods of teaching the subjects of the Elementary School curriculum (Scotch Code, Articles 19 (*a*) 4–7).

3. (*a*) School organization and classification.

(*b*) School registers, the mode of keeping them, and of making returns from them.

4. The laws of health as applied to school premises, scholars and teachers.

5. Quick's Educational Reformers, chapters 13, 14, 16, 17, 18, 19.

N.B.—Candidates who desire to obtain special recognition as teachers of infants, are referred to the conditions laid down in Articles 51 and 74 of the Regulations for the Preliminary Education, Training, &c., of Teachers.

***Mathematics.** *Females* [100]. (*See note to Mathematics for Males which applies equally to Female Candidates.*) 1908.

One paper will be set on the Lower Grade Syllabus of the Leaving Certificate Examination, viz. :—

ARITHMETIC. The elementary rules; prime factors of numbers; weights and measures in common use; the metric system; vulgar and decimal fractions; elementary methods of approximate calculation by decimals; practical problems. The intelligent use of algebraical symbols is permitted, and no question will be set on recurring decimals.

ALGEBRA. Numerical interpretation of formulæ; simple algebraical transformations; the graphical representation of simple functions; equations of the first degree in one and two variables; easy quadratic equations; problems leading to the above equations.

GEOMETRY. The main propositions given in Euclid, Books I. and III., with deductions and constructions arising from them; simple loci; application of arithmetic and algebra to geometrical theorems and problems. Elementary drawing to scale. Proofs will be accepted which appear to form part of a logical treatment of the subject.

*NOTE.—*Female Candidates may take the papers on Mathematics set for Males (in place of that for Females), and receive the extra marks therefor.*

Mathematics. *Males.*

Two papers [100 each] will be set on the Higher Grade Syllabus of the Leaving Certificate Examination, viz. :—

ALGEBRA. The subjects of the Lower Grade; more difficult transformations, equations, and problems; application of graphical methods; elementary theory of indices including logarithms; surds; the remainder theorem; ratio; proportion; progressions. Arithmetical questions will also be set, including questions on theory and exercises involving the practical use of logarithms.

GEOMETRY. The main propositions in Euclid, Books I–VI. and XI., 1–21, with deductions and constructions arising from them, but excluding the theory of incommensurable quantities; the elementary properties of simple plane-faced solids; mensuration of plain and solid figures; approximate solutions by drawing to scale. Proofs will be accepted which appear to form part of a logical treatment of the subject.

TRIGONOMETRY. Elementary Trigonometry, including the solution of triangles, with the aid of four place logarithms. Graphical solutions of problems.

NOTE.—*All candidates must bring instruments to the Examination for correct drawing and measurement, viz., a ruler graduated in inches and tenths on one side, and in centimetres and millimetres on the other; a protractor graduated in degrees; set squares; and compasses.*

Political Economy—*Males* [75].

Elementary Questions in Political Economy.

Domestic Economy —*Females* [75].

1. Food—its composition, function, and preparation.
2. Clothing and Laundry.
3. The Dwelling.
4. The Laws of Health and Sick Room Management.
5. The Feeding and Management of Infants and Young Children.
6. Household Expenses and Investment of Money.

1908. **Needlework**—*Females* [75].

One of the following exercises will be set :—

(*a*) An examination paper testing the Candidate's practical knowledge of the methods to be pursued in teaching needlework to classes of children ;

or,

(*b*) An exercise in cutting out and fixing the various parts of some garment ;

or,

(*c*) An exercise in practical mending, darning, patching, &c.

1. The needlework course should include the various stitches used in the making and repairing of ordinary underclothing and of the articles included in the term house-linen.
2. The cutting-out in paper and in material of garments suitable for making up by children. The paper garments may be half-size.
3. The drawing of rough diagrams on the blackboard in illustration of the difficult points in a needlework lesson.
4. The drafting of patterns based on some simple system of measurements or proportion.
5. The stitches used in the higher branches of plain needlework : feather stitching, open hem stitch, whipping, etc.
6. The knitting of simple articles : vests, socks, stockings, etc.

Geography and Physiography.

1. An elementary knowledge of Physical Geography, comprehending the Composition and Phenomena of the Earth's Crust ; the Motions of the Earth ; the Seasons ; the Tides, Winds, and Ocean Currents.
2. The Physical, Commercial, and Industrial Geography of the British Empire.

Candidates may be asked to illustrate their answers by sketch maps.

See notes under History.

History.

1. A General knowledge of the most important events in British History, with dates.
2. British History from the Accession of James I. to the Restoration, with special reference to (*a*) constitutional questions ; (*b*) military operations ; (*c*) leading statesmen ; (*d*) great authors.

Note.—For the adequate study of this special period candidates should consult one or more of the chief authorities.

N.B.—Candidates who have not previously passed in Geography or History at the Scholarship Examination, or whose qualification under Article 79 does not include these subjects, must, unless they have obtained a pass at the Leaving Certificate Examination in English, including Geography and History, take these subjects at this Examination ; and, unless they obtain at least 40 per cent. of the maximum for either paper, or, if they have to take both History and Geography, then 40 per cent. of the maximum for the two papers combined, they will be held to have failed in the Examination.

Candidates who passed the Scholarship Examination before 1897, or who passed the Certificate Examination in first year papers before 1898, will be held to have qualified in Geography and History if at either of those Examinations they obtained not less than 40 per cent. of the maximum for the two subjects combined, failing which they will be required to take the subject or subjects for which they obtained less than 40 per cent. of the maximum, at this Examination.

Candidates who passed the Scholarship Examination in Scotland in (or since) 1897, or the Certificate Examination in (or since) 1898, have duly qualified in Geography and History, and cannot take these subjects at this Examination. This will not, however, entail any loss of marks.

II. OPTIONAL SUBJECTS. 1908.

Music.

Candidates are expected to have a knowledge of both notations.

NOTE.—Marks for Music are not given, unless the Candidate obtain at least 30 per cent. of the maximum marks for the Subject.

(*a*) PRACTICAL SKILL [30]:—

(i) To sing a short example in time and tune.

(ii) To beat time to a passage to the syllable *doh* (or *lah*).

(iii) To give the names of a short series of notes (the chord of the key being given).

(*b*) THEORY [20]:—

1. The compass and registers of the voices of men, women, and children. General rules relating to voice training of children.
2. Musical terms in common use.

Staff Notation.

3. Notes. Their position on the treble and bass staves. All the major and minor scales. Diatonic and chromatic intervals. Transposition.
4. Time. The value of notes, dotted notes, tied notes, and rests. Signatures of all the simple and compound times. Accent and syncopation. Contents of measures (bars). Transcription of time.
5. Translation into Tonic Sol-fa Notation.

Tonic Sol-fa Notation.

6. Notes. The major and minor modes. Diatonic and chromatic intervals. Names of chromatic tones. Removes of key, bridge notes, and distinguishing tones.
7. Time. All the measures in common use. Division of pulses into thirds and quarters. Accent and syncopation. Transcription by halving or doubling values, &c.
8. Translation into Staff Notation.

Languages [100 each].

1. LATIN.	3. FRENCH.
2. GREEK.	4. GERMAN.

(Candidates are restricted to **two** languages.)

The papers will contain passages for translation from and into English prose, with questions upon the construction of particular sentences. They will also contain passages of poetry for translation into English prose. In the German paper marks will be allowed for the use of German Script.

Candidates who take French or German will be required to read (not translate) easy French or German narrative to H.M. Inspector at his visit to their School next before the Examination, and unless a reasonably high standard is reached, a deduction will be made from the marks obtained for the written paper. On the other hand, marks will be added in the case of candidates who do well in this test.

NOTE.—*Candidates who fail to obtain at least 25 per cent. of the maximum for any Language will not be credited with any marks in that subject.*

1908. **DRAWING AND SCIENCE**

Marks will be awarded for satisfactory work at † courses of instruction conducted under Article 91 (d) of the Code or Article 55 of the Regulations for the Preliminary Education, Training &c., of Teachers in the following subjects:—

A. *Physics and Chemistry*
*B. *Any branch of Biology.*
C. *Drawing.*
D. *Navigation.*

The maximum marks for Drawing or Science can be obtained only when the Course or Courses of instruction attended extend to not less than 3 years of study.

Marks for Science and Drawing are also awarded for successful work in those subjects as tested at the Leaving Certificate Examinations, even though the Candidate may have fallen short of the standard required for a pass, but the *maximum* marks cannot be obtained unless such work has been supplemented by subsequent attendance at Courses referred to above.

* Students claiming marks in respect of attendance at a Course under B will, as a rule, be expected to give evidence of previous attendance and satisfactory work at a course under A, and when this condition is not fulfilled the marks awarded may be reduced.

† Other suitable courses may be recognised, but candidates who propose to attend a course of instruction other than one conducted under Article 55 of the Regulations for the Preliminary Education, Training, &c., of Teachers, should be careful to ascertain from the managers that it has been specially approved by the Department for the purpose of the award of marks at the Certificate Examination. No marks can be allowed if the course has not been so approved.

NOTE.—In special circumstances, where a candidate has been unable to qualify for marks under the above regulations, marks for DRAWING may be allowed in respect of passes obtained BEFORE 1902 at the local examinations in that subject.

GRADUATES.

NOTE.—*The following Regulations apply only to Candidates who graduated in or before the year 1906.—The Department must be satisfied as to the adequacy of the* preliminary *course of training undergone by the candidates. They will also look narrowly into the answers given to the questions in the two papers set for these candidates, and will require evidence of a sound knowledge of the first principles of teaching.*

(1.) The Examination of Candidates admitted under Article 72 (c) of the Regulations for the Preliminary Education, Training, &c., of Teachers will commence at 10 a.m., and will be completed at 5.30 p.m. on Wednesday the 8th July, 1908.

(2) The *papers set will be (*a*) the School Management paper (*see* page 5) and (*b*) a special paper for graduates, which will include questions to test their knowledge of elementary subjects and the methods of teaching them.

* The Department may accept in place of the above papers—

A certificate or diploma granted by a Scottish University upon an examination following a full course of instruction in the principles, methods, and history of Education, and a course (held sufficient by the Department) of practical training in a school or schools approved by the Department. The examination will be conducted jointly by the University authorities and one or more of the Chief Inspectors, and must be such as to satisfy the Department as to the candidate's knowledge of elementary subjects and the methods of teaching them—*see* Article 48 (*b*) of the Code of 1906.

BOARD OF EDUCATION.

REPORT

FOR THE YEAR 1906

ON

THE VICTORIA AND ALBERT MUSEUM,

THE ROYAL COLLEGES OF SCIENCE AND OF ART,

THE GEOLOGICAL SURVEY AND MUSEUM,

AND ON THE WORK OF

THE SOLAR PHYSICS COMMITTEE.

Presented to Parliament by Command of His Majesty.

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E. PONSONBY, 116, GRAFTON STREET, DUBLIN.

1908.

[Cd. 3978.]

PREFATORY NOTE.

This Volume contains Reports taken from the official records of the Victoria and Albert Museum, the Royal Colleges of Science and of Art, the Geological Survey and Museum and Solar Physics Committee.

The Reports on the Museums, the Geological Survey, and the Solar Physics Committee deal with the work of those Institutions during the year 1906, and the Reports on the Royal Colleges deal with the work of the Session 1905–1906.

March, 1908.

Robert L. Morant

9856. 75—Wt. 30835. 5/08. Wy. & S.—6105*r*.

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THE VICTORIA AND ALBERT MUSEUM.

THE VICTORIA AND ALBERT MUSEUM.

Report and Returns for the Year 1906.

THE ART MUSEUM.

The number of objects acquired for the Art Museum by purchase, gift or bequest was 909. The following list gives the principal acquisitions made in the various sections during the year 1906, and also the chief loans for the same period.

I.—Sculpture.

By purchase :—	£	s.	d.
Two painted ivory caskets. Hispano-Moresque ; 13th or 14th century - - - - - - -	80	0	0
A stone chimneypiece of the Tudor period with earlier painted brickwork. From Prittlewell, Essex - - - - - - - - - -	25	0	0

By gift :—

Two heads from Græco-Buddhist figures ; found in Afghanistan. Given by Mrs. Simpson.

Marble bust of "Eve Disconsolate," by Hiram Powers ; given by Mrs. Rupert Potter.

Two plaster sketch-models by H. H. Armstead, R.A., for parts of the sculptured podium of the Albert Memorial, London ; given by Mrs. H. H. Armstead.

A stone chimneypiece of the Tudor period ; given by Mrs. Turner.

A carved and painted stone column, and two carved stone capitals. French-Romanesque, 12th century ; given by J. H. Fitzhenry, Esq.

A stone panel carved with the Annunciation and the Nativity. French (School of Troyes), 15th century ; given by J. H. Fitzhenry, Esq.

A stone panel carved with four figures under arcades. French, early 15th century ; given by J. H. Fitzhenry, Esq.

A carved stone doorway from Clermont-Ferrand, dated 1557 ; given by J.H. Fitzhenry, Esq.

A double water-jar-stand in stone, from Upper Egypt. Coptic, 7th century ; given by R. de Rustafjaell, Esq.

Fragments of painted wall-surfaces from the Temple of Mentuḥetep at Deir-el-Baḥri (excavations of 1905–6) ; found and given by the Egypt Exploration Fund.

Objects of ancient Egyptian workmanship from the excavations of 1905–6 at Tel-el-Yehûdîya, Saft-el-Henna and Gheyta; found and given by the British School of Archæology in Egypt.

An heraldic stone-panel from Goa. Indo-Portuguese, 17th century; given by J. W. Davison, Esq.

The following were the principal loans to this section during the year:—

Two examples of Græco-Buddhist sculptures from Gandhara (3rd century, A.D.) and six examples of Buddhist sculptures from Sarnath (about 1000 A.D.); lent by H.R.H. the Princess of Wales.

Seventy-six examples of Græco-Buddhist sculptures and other objects from Gandhara, Bannu and other Græco-Buddhist sites; lent by M. Longworth Dames, Esq.

Additions to the collection of Mediæval and Renaissance sculptures; lent by J. H. Fitzhenry, Esq.

Additions to the collection of Mediæval and Renaissance sculptures; lent by J. Pierpont Morgan, Esq.

II.—Textile Fabrics, Embroideries and Lace.

By purchase:—	£	*s.*	*d.*
Tapestry, woven in wool and silk with Chinese subjects. English (Soho), first half of 18th century	250	0	0
Satin brocade robe, satin damask with figure subjects, and an embroidered silk prayer-mat. Persian, late 16th to 18th century	250	0	0
Woollen pile carpet. Spanish, late 16th century	150	0	0
Two woollen pile carpets. From churches in Italy. Asia Minor, 16th century	119	4	8
Woollen pile carpet, woven with archaic representations of dragons and other animals. Probably produced in Persia, anterior to the 15th century	72	0	0
Three gold-embroidered velvet borders. Portuguese, 16th century	35	0	0
Silk brocade sash, woven with the weaver's name, "Leo Mazarski," and that of the factory, "Slyuk" (Sluck). Polish, 18th century	28	0	0

By gift:—

Woollen pile rug, woven with the coat-of-arms of the family Zavallos de Alarcon of Cuenca, New Castile. Spanish, 17th century; satin Court train decorated with embroidery and applied work. French, end of 19th century; given by Rt. Hon. Sir C. W. Dilke, Bart., P.C., M.P.

Two embroidered velvet rugs. Turkish, 18th or early 19th century; given by Sir I. Spielmann, F.S.A., through the National Art Collections Fund.

Woollen tapestry. Flemish, early 16th century; given by Sir J. C. Robinson, C.B.

A collection of 23 embroidered muslin and lace caps. Chiefly English, 18th and early 19th centuries; given by Sydney Vacher, Esq.

The following were the principal loans to this section during the year:—

Woollen tapestry panel, representing the Queen of Sheba testing the wisdom of King Solomon. German, middle of 15th century; lent by J. Pierpont Morgan, Esq.

A collection of needlepoint and pillow laces, 16th to 19th century; lent by Sydney Vacher, Esq.

III.—Woodwork, Furniture, Musical Instruments and Leatherwork.

By purchase:—	£	*s.*	*d.*
Two painted doors from the Hall of Forty Columns (*Chihl Sitūn*) in the Royal Palace at Ispahan, built during the reign of Shah Abbas I., "The Great" (1587–1628)	125	0	0
Four columns of carved teak, part of a set of twelve, which originally supported a pavilion at the Adahana Malua Vihara, Kandy, Ceylon. Erected by King Pakrama Bahu II. about 1200 A.D.	100	0	0
Cabinet, painted with the legend of St. George, by William Morris	66	3	0
Oak cupboard, with marquetry panels and ebony ornaments. Dutch, first half of 17th century	53	12	6
Cabinet of shisham wood, inlaid with ivory. Indian (*Panjab*), 17th century	40	0	0
Coffer of carved and inlaid oak, bearing the arms of the City of Lübeck. German, 17th century	30	0	0
Marquetry dressing table. English, late 18th century	30	0	0
Oak draw-table. Dutch, first half of 17th century	29	3	4
Coffer of incised cypress wood. Italian, 16th century	25	0	0

By gift:—

Carved wood female figure with shield, from Eu. French, 15th century; two panels of a Rood Screen, with figures of St. Helen and a nun, painted and gilt. From Tatterford Church, Norfolk, late 15th century; given by J. H. Fitzhenry, Esq.

Plaster ceiling from No. 16, Bishopsgate Street. Second quarter of 18th century; given by the Worshipful Company of Cordwainers of the City of London.

Throne-couch (*Selon*) of carved wood, gilt and enriched with glass mosiac (*Thuyé*-work). Burmese, 19th century; taken at the Siege of Mandalay in 1886; given by Lady Grant-Duff.

The following was the principal loan to this section during the year:—

Painted Sedan Chair, from designs by Robert Adam. English, late 18th century; lent by Sir H. Watkin Williams-Wynn, Bart.

IV.—Keramics, Glass and Enamels.

By purchase:—	£	*s.*	*d.*
A panel of stained and painted glass with the Arms of Klingeberg. Swiss, first half of 16th century	397	4	4

	£	*s.*	*d.*
A pair of enamelled brass candlesticks. English, first half of 17th century	300	0	0
A collection of Turkish tilework and pottery from Konia	244	0	0
A collection of Pottery from the site of ancient kilns at Sawankalok, Siam	210	0	0
A bowl of earthenware with the arms of Gabrielli. Hispano-Moresque (Valencia), second half of 15th century	144	0	0
A collection of English glass of the 18th and early 19th century	50	0	0

By gift :—

Specimens of French and English porcelain and earthenware ; given by J. H. Fitzhenry, Esq.
Specimens of earthenware and glass. English, 18th and 19th centuries ; given by C. B. Farmer, Esq.

The following were the principal loans to this section during the year :—

Additions to his collection of porcelain and earthenware ; lent by G. Salting, Esq.
Additions to his collection of earthenware, glass and enamels ; lent by J. Pierpont Morgan, Esq.
Additions to his collection of porcelain, earthen ware, glass and enamels ; lent by J. H. Fitzhenry, Esq.
Two sauceboats of Plymouth porcelain, dated 1770 ; lent by S. T. Whiteford, Esq.

V.—Metal Work, Coins and Medals, Arms and Armour, Silversmiths' Work, Jewellery and Goldsmiths' Work.

By purchase :—	£	*s.*	*d.*
Silver-gilt medallion. South German, late 15th century	55	0	0
A Swedish beaker of engraved silver ; early 17th century	45	0	0
A clock-watch with leather outer case and key. South German, second half of 18th century	40	0	0
A Tibetan helmet	40	0	0
Silver-gilt pendant. The Crucifixion. German, about 1500	35	4	7
A seal-matrix of a convent of St. John the Baptist. English, 14th century	35	0	0
A set of silver objects for use in the Betel Ceremony. From Java	29	16	0
Silver-gilt pendant. St. Anne with the Virgin and Child. German, about 1500	28	3	7
Two candlesticks of hammered brass. English, second half of 17th century	26	5	0
A seal-matrix of the Prioress of the monastery of St. Catherine at Siena. Italian, late 14th century	26	0	0
A matrix of a personal seal bearing the initials T.W. English, late 14th century	12	10	0

By gift :—

Six bronze medals by Hamerani, Travani and Kornmann ; also a bronze weight of Toulouse ; and a table clock in gilt bra-s case, engraved with subjects after Etienne Delaune, with outer case of leather, decorated with gilt tooling, French, second half of 16th century ; given by Max Rosenheim, Esq., through the National Art Collections Fund.

Mace, silver and silver-gilt. Italian, middle of 18th century ; with leather case decorated with gilt tooling ; given by Col. W. Fearon Tipping.

A well-top and spout of hammered iron, German, 17th century ; a portion of a font in cast lead, probably of the 13th century ; an iron vane in form of a cock, French, 18th century ; given by J. H. Fitzhenry, Esq.

The following were the principal loans to this section during the year :—

Additions to his collection of silver ; lent by H. D. Ellis, Esq.

Additions to his collection of silver ; lent by J. H. Fitzhenry, Esq.

Additions to his collection of silver ; lent by C. J. Jackson, Esq.

Additions to his collection of watches ; lent by F. G. Hilton Price, Esq.

Three silver vases and covers, English, 1785–6, and six specimens of Sheffield plate, 18th century ; lent by Miss M. B. Hudson.

Eleven specimens of silver plate, English, 17th century ; lent by S. Morse, Esq.

Silver-gilt cup and cover, English, early 17th century ; lent by Miss E. T. Tanner.

VI.—Paintings.

Two paintings in water-colours, one in oils, and one cartoon were received by gift; and seventeen water-colour paintings (including five miniatures), and one painting on plaster were purchased. The principal acquisitions are a small study in water-colour by Sir J. E. Millais of his oil painting, "The Eve of St. Agnes"; a study by Albert Moore for the tempera frieze, "A Greek Play," originally over the proscenium of the Queen's Theatre, Long Acre, and now in the Museum; a portrait of T. D. Walter, Esq., by John Downman, A.R.A., and a miniature portrait of Miss Wells, by Lawrence (or Lewis) Crosse.

VII.—Reproductions.

The reproductions in metal acquired in 1906, consist of 122 plaques and medals by Peter Flötner (*d.* 1546), and the Boleyn Cup of the year 1535–56 at Cirencester Church.

The reproductions in plaster acquired during the year include—an early 5th century female bust, in coloured marble, from the Athenian Akropolis, now in the Akropolis Museum; two Byzantine capitals, from S. Vitale, Ravenna; relief of the Virgin, from S. Maria in Porto, Ravenna; a group of the Virgin and Child ; two statues of SS. Barbara and Stephen; and a monument of Rudolf von Scherenberg, by Tylmann Riemenschneider, from Würzburg.

THE ART LIBRARY.

The following list gives the principal acquisitions made in the various sections during the year 1906 :—

I.—Books.

By purchase :—

Manuscript. The art of limning, ether by ye life, landscip or histories, 1664, 1685. Vellum binding with the arms, as Bishop of Lincoln (1621–41), of John Williams, Archbishop of York.

Gebhart (E.). Sandro Botticelli et son époque. With Atlas of 70 (10 col.) photo-engr. 1907 (06).

Hendley (T. H.) Asian carpets; XVI. and XVII. century designs from the Jaipur palaces. 146 (138 chromo–) lithogr. 1905.

Lanckoroński (K., Count). Der Dom von Aquileia, sein Bau und seine Geschichte. 11 photo-engr., 12 chromo-lithogr., and other illus. 1906.

Martin (F. R.). A History of Oriental Carpets before 1800. Chromo-phototype plates. 1906 et seq. (To be completed in 3 parts.)

Monte Cassino: Abbey. Bibliotheca Casinensis, seu codicum manuscriptorum . . . series . . . speciminibus ad unguem exemplatis aucta, etc. Chromo-photo-lithogr. 4 vols. 1873-80.

Murray (C. Fairfax). A selection from the collection of drawings by the Old Masters formed by C.F.M. 292 phototypes. 1905.

Peñafiel (A.). Monuments of ancient Mexican art. With atlas of 318 (many chromo-)lithogr. 1890.—Teotihuacan: estudio histórico y arqueológico. 92 (1 col.) phototypes. 1900.—Indumentaria antigua . . . de los Mexicanos. 204 (many chromo-) plates. 1903.

Rust (M.) . . . The Queen of the Fishes. . . . With illustrations (incl. 5 cuts printed in colours) by L. Pissarro. Eragny Press. 1894.

Stasov (V.). L'ornement slave et oriental, d'après les manuscrits. 157 chromo-lithogr. 1887.

Vienna: K. K. Oesterr. Museum für Kunst und Industrie. Ancient Oriental carpets. Chromo-lithogr. 1906 et seq. (To be completed in 4 parts.)

Wedgwood (J.). An address to the workmen in the pottery, on the subject of entering into the service of foreign manufacturers. 1783.

By gift :—

Bible. Textus Biblie. Cuts. Fol. Lugduni, J. Crespin, 1529. Addition to the collection of books from the library of the late Lady Dilke; given by Sir Charles Dilke, Bart., M.P.

Carter, (R. R.). Pictures and engravings at Haughton Hall, Tarporley, in the possession of R. Brocklebank. 26 photo-engr. 1904. Given by Ralph Brocklebank, Esq.

Cary (C.). Catalogue of various archaic and other Chinese bronzes, including a specimen of Mohammedan blue porcelain (Mr. Cary's collection). 29 photogr. 1906. Given by Clarence Cary, Esq.

Colvin (S.). Early engraving and engravers in England (1545–1695). 41 photo-engr. and other illus. 1905. Given by the Trustees of the British Museum.

Cook (Sir F. L., Bart.). Abridged catalogue of pictures at Doughty House, Richmond (belonging to Sir F. L. Cook). 1903. Given by Herbert F. Cook, Esq.

Day (Major C. R.). Manuscript and proofs of "The music and musical instruments of Southern India and the Deccan," with correspondence, drawings, proofs of illustrations, etc. 1888–98. Given by Mrs. C. R. Day.

Destrée (J.). Tapisseries et sculptures bruxelloises à l'Exposition d'art ancien bruxellois, . . . 1905. 50 (4 col.) phototypes and other illus 1906. Given by the Exhibition Committee.

Liverpool Public Library. Catalogue of the art library bequeathed by H. F. Hornby, Esq. 1906. Given by the Library and Museum Committee of the Corporation of Liverpool.

Ney Pilisi (B.). Le Palais du Parlement hongrois. Œuvre d' E. Steindl. 51 photo-engr., 3 (1 chromo) phototypes and other illus., 1906 ; given by the Government of Hungary.

Villahermosa (Duchess of). Album Cervantino Aragonés. Illus. (some col.). 1905. Given by the Duchess of Villahermosa.

Wedgwood (J.). Correspondence of J. W., 1781–1794. Map. 1906. Given by Lady Farrer.

A collection of 36 volumes, chiefly on the history of art ; given by George Wardle, Esq.

II.—Prints and Drawings.

By purchase :—

Mezzotint : "A Real Scene in St. Paul's Churchyard on a Windy Day." After Robert Dighton.

Proof Illustrations (56) to Samuel Rogers's "Italy" (1830). After J. M. W. Turner, R.A., and other artists.

Coloured Etchings by W. Lee Hankey (6), C. Cottet, Clarence Gagnon (4), A. Lafitte, H. Jourdain, M. Robbe (2), C. Houdard, and G. de Latenay.

Engraved Wood Blocks from drawings by G. J. Pinwell (3), M. W. Ridley, H. Furniss and E. Linley Sambourne (3).

Drawings on wood-blocks by Professor Sir H. von Herkomer, R.A., E. Linley Sambourne (3), G. Du Maurier (3), Miss M. E. Edwards, Richard Doyle, and H. Furniss.

Drawings (3) for illustrations to "Poems by Jean Ingelow" (1867), by J. W. North, A.R.A.

Drawings (3) for illustrations to "Poems by Jean Ingelow" (1867), by G. J. Pinwell.

Drawings (2) for illustrations to "Wayside Posies" (1867), by G. J. Pinwell.

Portrait (pen and pencil) of G. J. Pinwell, by T. White.

Sketch Book, containing 83 sheets of pencil sketches by W. Collins, R.A.

Pen Drawings (2) for "Ally Sloper's Half-Holiday," by W. G. Baxter.

Pen Drawings (5) for "Punch," with proofs, by E. Linley Sambourne.

Pen Drawings (5) for illustrations to Tennyson's "Enoch Arden" (1886), by Arthur Hughes.

Pen Drawings (13) for illustrations to "Bracebridge Hall," etc., and a design for a frieze, all by Randolph Caldecott.

Sketch Books (3) of studies of animals by Harrison W. Weir.

Illuminated initial letters (13) cut from an Italian manuscript of the 15th century.

Illuminated MSS. : 56 leaves from a Latin Bible, North-Eastern French, c. 1300.

Designs for Furniture (146) attributed to T. Chippendale and other contemporary designers.

Designs for Furniture (98) by J. Crabb. 1st half of the 18th century.

By gift :—

Collection of Lithographs by various modern British artists ; and 6 Etchings by the donor. Given by F. Goulding, Esq.

Coloured Etchings (18) by the donor. Given by W. Lee Hankey, Esq.

Etchings (14) by Colin Hunter, A.R.A. Given by J. Young Hunter, Esq.

Volume containing 125 drawings of crosses, by W. Simpson, R.I.; and 11 drawings of Buddhist Architecture near Jellalabad, by the same artist. Given by Mrs. M. E. Simpson.

Measured Drawings of Architecture:—48 Drawings or sets of Drawings (described in detail on p. 34) have been received from the Committee for the "Phené Spiers Collection of Drawings of Architecture."

III.—Photographs.

By purchase:—

Photographs (376) of paintings in private galleries in England.
Photographs (100) of paintings in the National Gallery.
Photographs (100) of Architecture and Sculpture at Athens.
Photographs (64) of Architecture and Sculpture in Java.
Photographs (54) of Architecture and Sculpture at Delphi.
Photographs (83) of Mosaics at Ravenna and Venice.
Photographs (54) of the Pavement in Siena Cathedral.
Photographs (103) of Hamilton Palace and Park.

By gift:—

Photographs (812) of Industrial Art at Prague. Given by Herr Langhans.

Photographs (362) of Indian Architecture. Given by Mr. R. Coston Taylor.

Photographs (90) of South Kensington Museum, Horticultural Gardens and Buildings in Rome. Given by Mr. Alan S. Cole, C.B.

Photographs (21) of Norman Doorways and Tympana. Given by Mr. C. E. Keyser in continuation of a collection given in former years.

Museum Publications:—

The following new publications have been issued, viz.:—

Volume II. of the Handbook on Chinese Art by Dr. Stephen W. Bushell, C.M.G.

Part II. of the Handbook on Ancient and Modern Ships, by Sir George C. V. Holmes, K.C.V.O., C.B.

A Catalogue of Prints, Part II., Modern Etchings and Aquatints of the British and American Schools in the National Art Library.

A fresh edition of the Handbook on Japanese Pottery by the late Sir Augustus W. Franks, K.C.B., F.S.A., has been published to which numerous illustrations have been added.

It was decided to issue cheap lists of the various classes of objects in the Museum, of which the first, a list of Samplers, is now on sale.

CIRCULATION.

During the course of the year the loan to Bradford Museum was renewed, and a collection was sent for the first time to Chelmsford Museum.

The number of Museums receiving loans from the Board during the year was 93, including the Royal Scottish Museum, Edinburgh, and the Museum of Science and Art, Dublin.

The historical collections of water-colour paintings of the British School were exhibited at Bolton, Brighton, Bristol, Carlisle, Cheltenham, Leek, Oldham, Sunderland, Wolverhampton, and Worcester. The collection of water-colour paintings of Pompeii was lent to Bootle, Oldham and Rotherham. The collection of embroideries was exhibited at Leeds.

The collection of tools and materials used in etching and engraving was lent to Bradford. Collections of autotypes of paintings in the National Gallery were lent to Arbroath, Bootle, Dundee, Oldham, and Perth. A collection of drawings of Old London was lent to Camberwell and Reading.

A selection of the works which gained awards in the National Art Competition was exhibited at Batley, Belfast, Coventry, Sunderland, and Warrington.

The Board lent collections to 30 temporary exhibitions, the more important of which were:—

Carmarthen, Lincoln and Shrewsbury Arts and Crafts Exhibitions, and Whitechapel.

A small collection of Drawings was lent to Milan Exhibition. Examples of Industrial Art, similar to those lent to Schools of Art, were sent on loan to Jamaica. A collection was sent to the New Zealand Exhibition, illustrative of the circulation of works to schools and classes. The Board also lent a few oil paintings to Toronto.

The visits of Curators and Masters to the Circulation Division for advice as to loans and grants numbered 203.

The most remarkable feature during the year was the large increase in the number of examples issued on loan to schools and classes; this is partly due to the facilities offered to the Masters for visiting the Museum and making their own selections. Ten years ago the number of objects on loan was 6,696, whereas in 1906 it was no less than 24,081.

The number of objects on loan at Museums during the year was 23,539.

The number of objects lent to Exhibitions was 3,120.

The number of objects on loan at Schools and Classes was 24,081.

The total number of works of art on loan during the year was 53,128.

The details of the grants-in-aid towards the purchase of works of art and science objects, amounting to £1,368 11s. 1d., will be found on page 50.

THE SCIENCE MUSEUM.

MACHINERY AND INVENTIONS DIVISION.

During the year 1906 the Collections in this Division have been increased by the acquisition of 47 models or examples and 38 prints and drawings; also by the return of 10 objects which had been in the Museum formerly; 14 objects have been withdrawn, but 8 of these withdrawals have been of a temporary nature or have been followed by the substitution of newer objects; 3 objects hitherto on loan have been bequeathed; 1 object already in the Museum has been purchased. Eight drawings of old locomotives, preserved in the Museum, were sent to the Milan International Exhibition, for which they were prepared.

Of the acquisitions the following are the more notable:—

Model of Locomotive and tender, period 1850–60. Purchased.

Prof. Dalby's engine balancing apparatus. Made to order.

Model of a circulator for a steam generator. Lent by Messrs. Arthur Ross, Hotchkiss & Co.

Langdon's experimental electric motor (1891–2). Lent by the Langdon-Davies Motor Co.

Prepayment electricity meter. Lent by the Mordey-Fricker Electricity Meter Co., Ltd.

Model of filter press. Lent by Messrs. S. H. Johnson & Co., Ltd.

Model of a Brougham. Purchased.

Sliding wheel change-speed gear for motor car. Lent by the Clement Talbot Co, Ltd.

Epicyclic change-speed gear for motor car. Presented by the Albany Manufacturing Co., Ltd.

Differential gear for motor car. Presented by Oscar S. Thompson, Esq.

Examples of ball bearings. Lent by the Hoffmann Manufacturing Co., Ltd.

Roller bearings. Lent by the Hyatt Roller Bearing Co.

Model of hand boring plant. Presented by Messrs. Trauzl & Co.

Albion printing press. Purchased.

Hansen's "Writing ball" type-writer (1875). Presented by Peter Jenson, Esq.

Models of punching, shearing and notching machines. Lent by Messrs. Craig and Donald.

The air compressing plant in the Southern Galleries has been in operation daily, including Sundays, without interruption. The number of models shown in operation or so arranged that they can be started or worked by visitors is 213, showing a net increase of 9. Of this total 77 are in the Naval and Marine Engineering Division.

In the workshops attached to these Galleries the duties in connection with the running and maintenance of the machinery have been carried out as usual, concurrently with the work of repairing, cleaning, and sectioning objects for exhibition, and providing the gearing, &c., for those that were being set in motion. The new work has comprised: a tender for a model locomotive of 1840 purchased last year; this was ordered from a firm of model makers and finished in the Museum; a model of Beaumont's "vibromotor" applied to a coal screen, the drawings of which were supplied by the Hardy Patent Pick Co., was similarly obtained.

The necessary shop drawings for these and other models have been prepared by the staff, concurrently with the registration of objects, preparation of descriptive labels, revision of catalogues and the photographing of the more important objects. Labels to the number of 154 have been sent to the printers; a descriptive handbill to the Galleries has been revised and issued to the public; 38 photographic negatives have been taken and upwards of 400 lantern slides have been prepared from negatives already existing. The latter are being made up in sets following out, as far as practicable, the subdivisions of the Museum Collections as given in the catalogues; many of these sets are already available for loan to Science schools and to the public. Upwards of 150 students, accompanied by their teachers, have received special facilities in connection with their visits to the Southern Galleries, but the arrangements for the examination of the objects in these collections are such that comparatively few of the classes apply for additional assistance. Over 350 objects have been borrowed for use at the lectures in the Royal College of Science and the Royal School of Mines.

NAVAL AND MARINE ENGINEERING DIVISION.

During the year 1906 the collections in this Division have been increased by the addition of 12 objects, prints, etc.; also by the return of 3 objects which had been in the Museum formerly; in addition, 12 objects have been transferred from another Division. One object has been on circulation and 19 have been withdrawn. Four objects, hitherto on loan, have been bequeathed, including a valuable rigged model of a Maltese galley, which is stated to have belonged to the Knights of Malta.

The acquisitions include:—

Examples showing constructions of skins for high speed motor boats, Lent by J. A. Smith, Esq.

Reversible screw propeller for a motor boat. Lent by the Gaines Reversible Propeller Co.

Petrol motor for a launch. Lent by the Wolseley Tool & Motor Car Co., Ltd.

In the workshop before mentioned, in addition to the up-keep of working models there has been made for this Division a model of the beam engine, together with the necessary midship

portion of the hull and superstructure, of a typical American river paddle-wheel steamer of the last decade.

The masts, rigging and sails have been added to the hull of a representative clipper ship of 1868, the drawings for this work as well as certain other drawings and diagrams being prepared in the Museum.

Part II of the Museum Handbook "Ancient and Modern Ships" was placed on sale to the public at the end of the year.

BUCKLAND FISH COLLECTION.

The only addition during the year 1906 to the collection that deserves notice is:—

An Esquimaux boat or "Kayak" with complete outfit of weapons. Presented by Mrs. Bompas.

Several thousand fry of Salmonidæ have as usual been hatched out in the boxes and distributed. The hot weather during September, however, caused considerable mortality, more particularly among the older fish.

The work of framing the plaster casts, in order to display them to better advantage and to protect them further, is in progress.

The number of visitors to the Southern Galleries, in which are the Machinery, the Naval, and the Buckland Collections, was 377,077, which total is above the average for the last 5 years but below the corresponding figures for last year. The average attendance was 1,038 per diem, including Sundays; on week days alone it was 1,081, and on Sundays alone 785, but the average hourly attendance on Sundays is nearly double that on week days.

COLLECTIONS FOR SCIENTIFIC INSTRUCTION AND RESEARCH.

The following return shows the number of visitors to the Western Galleries during the last five years:—

Year.	Visitors.	Visitors receiving special assistance or facilities for the examination of Models & Apparatus.	Classes attending with their Teachers.	Approximate Average Number per Class.
1902	87,714	3,337	225	15
1903	89,074	4,495	317	14
1904	87,314	3 955	268	15
1905	93,180	3,546	268	13
1906	87,629	3,396	242	14

The interiors of the wall cases in the Physics, Biology and Geology sections have been re-coloured, and the contents of the cases re-arranged in the order followed in the catalogues of these sections.

The Jordan glycerine barometer and the Fortin standard instrument, exhibited near it, were cleaned and re-filled in the early part of the year. There is now a closer approximation in the readings of the two instruments, and errors of observation are more easily avoided.

There have been received for exhibition the samples of work from the schools of the late London School Board which were exhibited at the St. Louis Exhibition of 1904. These are shown in cases in the large class room in the upper gallery, and may be examined by teachers and others interested in the work of elementary schools.

The most valuable acquisition is the large projecting polariscope by Ahrens, which is an excellent example of this optician's work. It is fitted with polarizing and analyzing prisms of an exceptionally large size, and is supplied with a complete equipment of quartz, selenite and other plates requisite for crystallographic research.

The Stückrath pendulum-gravity-apparatus, lent to the Antartic Expedition, has been returned after re-standardization by the National Physical Laboratory and is exhibited in the lower gallery.

Sectional drawings showing the action or construction of certain pieces of physical apparatus have been prepared, and are shown with the instruments they illustrate.

During the year 107 descriptive labels have been prepared, and revised editions of Catalogues No. I (Mathematics and Standards of Measurement), and No. VI (Mineralogy and Geology) have been commenced.

The loans of apparatus, models and diagrams to the Royal College of Science, for lecture purposes and laboratory work, numbered 593, as compared with 661 in the previous year.

In Science Circulation 6 sets of apparatus, comprising 46 objects, were issued on loan to 5 Science Schools and Classes.

The following table shows how these numbers compare with those of former years :—

Year.	Number of Schools to which sets of apparatus have been sent.	Number of sets of apparatus circulated.	Number of objects in the sets.
1902	15	29	788
1903	9	10	363
1904	6	6	248
1905	4	6	120
1906	5	6	46

A detailed return of the Science Schools and Classes to which sets of apparatus have been lent during 1906 will be found on p. 10. In addition to the above loans to Schools and Classes, there have been lent :—

(*a*) A Milne Seismograph to the Royal Society.
(*b*) A Boulengé Chronograph to the Rev. F. J. Smith, of Trinity College, Oxford.

The acquisitions during the year 1906 were as follows :—

How Obtained.	Microscope Slides, Lantern Slides, and Specimens.	Models and Instruments.	Maps, Diagrams, and Photographs.	Total.
Purchased - -	3	57	9	69
Presented - -	—	4	10	14
Lent - - -	—	20	21	41
	3	81	40	124

The most important of these additions are :—

Mathematics and Measurement :—

1. (*a*) Troncet's arithmograph. (*b*) Palmer's computing scale with Fuller's improvements, 1843. Purchased.
2. (*a*) Fuller's spiral slide-rule. (*b*) Circular slide-rule for calculations in ballistics. Purchased.
3. (*a*) Pantograph by Burton. (*b*) Pantograph, in wood. Lent by J. Lecky.
4. Payne-Coradi parabolograph. Purchased.
5. (*a*) Pocket money-balance, made by Wilkinson in the latter part of the 18th Century. (*b*) Pocket balance for weighing gold coin, jewellery, &c. Patented by Hulls and Bradford, 1753. Lent by Miss Lecky.
6. Astronomical clock, designed by J. Vines of Newbury in 1836. Lent by Mrs. W. T. Shaw.
7. Clock used by Dr. Longfield, 1779. Made by Knapp of Cork. Lent by J. Lecky.
8. (*a*) Marine Chronometer by Arnold. (*b*) Marine Chronometer by Earnshaw, with Airy's compensation. Purchased.

Physics :—

1. Original apparatus used by the late Dr. F. Guthrie, F.R.S., in his researches on the conductivity for heat of liquids. Presented.
2. Apparatus to explain the principle of the Bunsen ice-calorimeter. Purchased.
3. Clément & Desormes' apparatus for determining the ratio of the two specific heats of a gas. Purchased.
4. Small Wollaston camera lucida. Lent by J. Lecky.
5. Projection polariscope by Ahrens with Nicol prisms of $3\frac{1}{4}$ and $3\frac{1}{2}$ inches aperture, quartz plates, wedges and various accessory pieces. Purchased.
6. Wild's polarimeter for sugar-testing. Purchased.
7. Diffraction chromoscope for viewing diffraction colour-photographs, with six examples of the latter. Purchased.
8. Box used in the daguerreotype process, for exposing plates to the vapour of iodine and bromine. Purchased.
9. Ewing's apparatus to illustrate progressive stages in the magnetization of iron. Purchased.
10. The "Broca" galvanometer as improved by Dr. Harker, with two additional pairs of coils. Purchased.
11. Vacuum tubes (3) of the H form, containing helium, argon and hydrogen respectively. Presented by A. C. Cossor.

Chemistry :—

1. (*a*) "Mecker" furnace with Bunsen burner. (*b*) "Mecker" burner for forced air. Purchased.

Metallurgy :—

1. Calcium ingots (2) obtained by the electrolysis of calcium chloride. Purchased.

Geology :—

1. Goldschmidt's two-circle contact goniometer. Purchased.
2. Specimen of ruby in calcspar matrix. From Burmah. Purchased.
3. Geological map of France. Produced under the superintendence of M. Michel-Lévy, 1905. Purchased.
4. Photographs (4) of the Milne-Casella seismograph. Presented by L. Casella.

Biology :—

1. (*a*) Solar microscope by Margas, 18th century. (*b*) Simple microscope by F. Watkins, 18th century. (*c*) Simple microscope for live specimens. (*d*) Wilson's pocket microscope, 18th century. (*e*) Chevalier's achromatic universal microscope, early 19th century. Purchased.
2. Wollaston single-lens micrometer. Made by Dollond, early 19th century. Purchased.
3. (*a*) Mosso's ergograph for studying the process of fatigue. (*b*) Mosso's plethysmograph for showing changes in the bulk of the arm and hand arising from variations of blood pressure. Purchased.
4. Models (25) illustrating the development of the amphioxus. Purchased.
5. Botanical diagrams by Kohl (2 sheets). Purchased.

Physiography :—

1. Syphon barometer, formerly the property of the late Admiral Fitzroy. Purchased.
2. Long-range mercury and glycerine barometer. Made by Negretti and Zambra. Purchased.
3. Galton's trace-computer for vapour tensions. Lent by the Meteorological Office.
4. (*a*) Pocket Galilean telescope with single eye-lens. Made by Dollond, 18th century. (*b*) Double-image micrometer eye-piece. Made by Dollond, early 19th century. (*c*) Surveyor's wheel. Made by W. and S. Jones, early 19th century. Purchased.
5. (*a*) Pocket Galilean telescope with four eye-lenses. Made by Dollond, 18th century. (*b*) Sundial by N. Bion of Paris, 18th century. Lent by J. Lecky.
6. Ramsden telescope, formerly the property of Dr. Lind, F.R.S. Late 18th century. Purchased.
7. Enlargements (6) on glass, of photographs of nebulæ and star clusters, taken by the late Dr. Isaac Roberts. Presented by Mrs. Isaac Roberts.

The transfers from other divisions comprise :—

1. Eastman's centrifugal emulsion apparatus.
2. Zippel and Bollmann's botanical diagrams.

THE SCIENCE LIBRARY.

The additions to the Science Library for the year 1906 comprise 913 volumes, of which 664 were purchased and 249 presented; 6,751 parts, pamphlets, &c., 4,869 purchased and 1,882 presented; 194 maps presented; and 16,151 specifications, &c., added to the Patent Section. 1,253 books sent on approval by various book-sellers were examined and dealt with during the year.

2,726 catalogue titles and cross references have been written during the year. The monthly catalogue slips from September, 1905, to March, 1906, comprising 1,456 printed titles have been received from the printer. 1,286 titles were added to the Author Catalogue, which now contains 29,042 cards. 5,814 cards were added to the Subject Catalogue, which is now complete as far as purely scientific subjects are concerned. It contains in all 32,722 cards. 746 cards were written for the small MS. Subject Catalogue of recent additions to the Library. 24,575 cards were added to the Biological Bibliography of the Zurich Concilium Bibliographicum and 100 to the Mathematical Bibliography of the International Mathematical Congress.

5,353 titles have been mounted on cards, 1,436 books were collated and prepared for binding, and 1,841 volumes and parts were collated before registration by the Library staff. 1,256 volumes have been bound and 38 repaired.

During the year there were 14,301 visitors to the Library and 162 to the Patent Section, an increase, as compared with the previous year, of 334 readers in the Library, and 27 in the Patent Section. In addition to the books supplied to readers in the reading room, 1,709 have been issued on loan to the Staff of the Royal College of Science, 818 to Museum Officers, and 133 to Officers of the Museum of Practical Geology, Jermyn Street.

The following table shows the number of readers in the Library during the past five years:—

Year.	School Teachers, &c.	Students in Dept. Schools.	Consulters of Patent Specifications.	Other Readers.	Total.
1902 - -	1,663	6,425	232	3,522	11,842
1903 - -	1,818	6,942	189	4,053	13,002
1904 - -	1,365	8,436	214	4,238	14,253
1905 - -	1,556	8,646	135	3,765	14,102
1906 - -	1,185	9,421	162	3,695	14,463

Amongst the publications purchased may be mentioned:—

Annales de Paléontologie. Publiées sous la direction de Marcellin Boule. Tome I *and onwards.* Paris, 1906, *&c.* *4to.*

Baeyer, Johann Friedrich Wilhelm Adolf *Ritter* von. Adolf von Baeyer's Gesammelte Werke. Herausgegeben zur Feier des siebzigsten Geburtstages des Autors von seinen Schülern und Freunden. Braunschweig, 1905. *2 Bde.* *8vo.*

Beck, Carl Richard. The nature of ore deposits. Translated and revised by W. H. Weed. New York and London, 1905. *2 vols. 8vo.*

Beiträge zur Mineralogie von Japan. Herausgegeben von T. Wada. Nummer 1 *and onwards.* Tōkyō, 1905, *&c. 8vo.*

Beltzer, Francis J. G. La grande industrie tinctoriale. Paris, 1906. *8vo.*

Berthelot, Marcellin Pierre Eugène. Archéologie et histoire des sciences. Paris, 1906. *4to.*

Biochemical Journal (The). Edited by Benjamin Moore and Edward Whitley. Vol. I *and onwards.* Liverpool, 1906, *&c. 8vo.*

Biochemische Zeitschrift. ... Redigiert von C. Neuberg. Erster Band *and onwards.* Berlin, 1906, *&c. 8vo.*

Brouardel, Paul Camille Hippolyte, *and* Mosny, E. Traité d'Hygiène. Publié ... sous la direction de MM. P. Brouardel [et] E. Mosny. *In progress.* Paris, 1906, *&c. 8vo.*

Chicago: University of Chicago. Studies in general physiology. By Jacques Loeb. Decennial Publications. Second Series. Volume XV. Chicago, London, 1905. *2 pts. 8vo.*

Chvolson, Orest Daniilovich. Traité de physique. Ouvrage traduit sur les éditions russe & allemande par E. Davaux. Édition revue et considérablement augmentée par l'auteur, suivie de notes de la physique théorique par E. Cosserat [et] F. Cosserat. *In progress.* Paris, 1906, *&c. 8vo.*

Clements, Frederic Edward. Research methods in ecology. Lincoln, Nebraska, 1905. *8vo.*

Cossmann, Alexandre Édouard Maurice, *and* Pissarro, G. Iconographie complète des coquilles fossiles de l'Éocène des environs de Paris. *In progress.* Paris, 1904, *&c. 4to.*

Demoulin, Maurice. La locomotive actuelle. Étude générale sur les types récents de locomotives à grand puissance. Paris, 1906. *8vo.*

Euclid. Εὐκλειδου στοιχειων βιβλ. ιέ. ἐκ των θεωνος συνουσιων. Εἰς του αὐτον το πρωτον ἐξηγηματων Προκλου βιβλ. δ'. Adjecta praefatiuncula in qua de disciplinis mathematicis nonnihil. [Edited by Simon Grynæus.] *In Gk.* Basileæ apud Joan. Hervagium, M.D. XXXIII. *ED. PR. 2 vols. in 1. fol.*

Fleming, John Ambrose. The principles of electric wave telegraphy. London, *&c.*, 1906. *8vo.*

Fortschritte auf dem Gebiete der Röntgenstrahlen. ... Herausgegeben von Dr. med. Deycke und Dr. med. Albers-Schönberg. Erster Band *and onwards.* Hamburg, 1897–1898, *&c. 4to.*

Giglio-Tos, Ermanno. Les problèmes de la vie. *In progress.* Turin (Cagliari), 1900, *&c. 8vo.*

Glück, Hugo. Biologische und morphologische Untersuchungen über Wasser- und Sumpfgewächse. Herausgegeben von Professor Dr. Hugo Glück. Jena, 1905. *8vo.*

Glückauf. Berg- und Huttenmännische Zeitung. (41. Jahrgang, 1905, *and onwards.*) Redaktion: Bergmeister Engel, *&c.* Essen, 1905, *&c. 4to.*

Groth, Paul Heinrich. Chemische Krystallographie. *In progress.* Leipzig, 1906, *&c. 8vo.*

Guillet, Léon. Étude industrielle des alliages métalliques. Texte (*and* Album de Micrographies). Paris, 1906. *2 vols. 8vo.*

Hamilton, Angus. Afghanistan. London, 1906. *8vo.*

Harvie-Brown, John Alexander. A fauna of the Tay basin and Strathmore. Edinburgh, 1906. *8vo.*

Hefter, Gustav. Technologie der Fette und Öle. ... Unter Mitwirkung von G. Lutz, O. Heller, *&c.*, herausgegeben von G. Hefter. *In progress.* Berlin, 1906, *&c. 8vo.*

High Tension Power Transmission.

High Tension Power Transmission. A series of papers and discussions presented at the meetings of the American Institute of Electrical Engineers, under the auspices of the Committee on High Tension Transmission. (Second volume. A series of papers and discussions presented at the International Electrical Congress in St. Louis, 1904.) New York, 1905(–1906). *2 vols. 8vo.*

Johnston, *Sir* Henry Hamilton. Liberia. With an appendix on the flora of Liberia by Dr. Otto Stapf. London, 1906. *2 vols. 8vo.*

Jordan, David Starr. A guide to the study of fishes. Westminster, 1905. *2 vols. 8vo.*

Journal of Biological Chemistry. Edited by J. J. Abel and C. A. Herter, with the collaboration of R. H. Chittenden, *&c.* Vol. 1 *and onwards.* New York City, 1905–6, *&c. 8vo.*

Kemp, James Furman. The ore deposits of the United States and Canada. Sixth impression. New York, London, 1905. *8vo.*

Knuth, Paul Erich Otto Wilhelm. Handbook of flower pollination. Based upon Hermann Müller's work "The fertilization of flowers by insects." Translated by J. R. Ainsworth Davis. *In progress.* Oxford, 1906, *&c. 8vo.*

Koenig, Franz Joseph. Die Untersuchung landwirthschaftlich und gewerblich wichtiger Stoffe. Praktisches Handbuch. Dritte ... Auflage. Berlin, 1906. *8vo.*

Lippincott, J. B. Lippincott's New Gazetteer. A complete pronouncing gazetteer, or geographical dictionary of the world. . . . Edited by Angelo Heilprin and Louis Heilprin. London, 1906. *8vo.*

Lorentz, Hendrik Antoon. Abhandlungen über theoretische Physik. *In progress.* Leipzig und Berlin, 1906, *&c. 8vo.*

Lorentz, Hendrik Antoon. Lehrbuch der Physik. . . . Von H. A. Lorentz. Nach der vierten von H. A. Lorentz und L. H. Siertsema bearbeiteten Auflage und unter Mitwirkung des Verfassers aus dem Holländischen übersetzt von G. Siebert. *In progress.* Leipzig, 1906, *&c. 8vo.*

Mathey, Alphonse. Traité d'exploitation commerciale des bois. Paris, 1906. *8vo.*

Mayr, Heinrich. Fremdländische Wald- und Parkbäume für Europa. Berlin, 1906. *8vo.*

Morat, Jean Pierre. Physiology of the nervous system. . . . Translated and edited by H. W. Syers. London, 1906. *8vo.*

Nencki, Marceli. Marceli Nencki opera omnia. Gesammelte Arbeiten von Prof. M. Nencki. [Edited by N. Sieber and J. Zaleski.] Braunschweig, 1904 (–1905). *2 Bde. 8vo.*

New Phytologist (The): a British botanical journal. Edited by A. G. Tansley. Vol. 1 *and onwards.* London, 1902, *&c. 8vo.*

Norman, Alfred Merle, *and* Scott, Thomas. The crustacea of Devon and Cornwall. London, 1906. *8vo.*

Osgood, William Fogg. Lehrbuch der Funktionentheorie. Leipzig und Berlin, 1906. *8vo.*

Paris: Société de Géographie. Documents scientifiques de la Mission Saharienne. Mission Foureau-Lamy. Par F. Foureau. Paris, 1905. *Texte, 2 tom.*; *Cartes, 1 tom. 4to.*

Pearson, William. An introduction to practical astronomy. London, 1824 (–1829). *2 vols. 4to.*

Repertorium novarum specierum regni vegetabilis. Centralblatt für Sammlung und Veröffentlichung von Einzeldiagnosen neuer Pflanzen. Auctore Friderico Fedde. Fasciculus 1 (1905) *and onwards.* Leipzig, 1906, *&c. 8vo.*

Roemer, Carl Ferdinand von. Lethaea geognostica, oder Beschreibung und Abbildung der für die Gebirgs-Formationen bezeichnendsten Versteinerungen. *In progress.* Stuttgart, (1876), *&c. 8vo.*

Russell, Alexander. A treatise on the theory of alternating currents. Cambridge, 1904 (–1906). *2 vols. 8vo.*

Sammlung naturwissenschaftlich-pädagogischer Abhandlungen. Herausgegeben von Otto Schmeil und W. B. Schmidt. *In progress.* Leipzig und Berlin, 1905, *&c. 8vo.*

Schlich, William. Schlich's manual of forestry. London, (1895–) 1906. *5 vols. 8vo.*

Science Progress in the Twentieth Century. A quarterly journal of scientific thought. No. 1, July, 1906, *and onwards.* Editors: N. H. Alcock, W. G. Freeman. London, 1906, *&c. 8vo.*

Strasburger, Eduard. Die Coniferen und die Gnetaceen. Eine morphologische Studie. Jena, 1872. *2 vols. 8vo and fol.*

Taylor, H. Dennis. A system of applied optics. London, New York, 1906. *8vo.*

United States: International Union for Co-operation in Solar Research. Transactions. Vol. 1 *and onwards.* Manchester, 1906, *&c. 8vo.*

Vienna: Kaiserliche Akademie der Wissenschaften, das Salz. Dessen Vorkommen und Verwertung. . . . Verfasst von J. Ottokar Freiherrn von Buschman. *In progress.* Leipzig, 1906, *&c. 4to.*

Washington: Carnegie Institution. Bacteria in relation to plant diseases. By Erwin F. Smith. Washington, D.C., 1905. *4to.*

Weber, Heinrich, *and* Wellstein, Josef. Encyklopädie der Elementar-Mathematik. . . . Erster Band *and onwards.* Leipzig, 1906 (1905), *&c. 8vo.*

Winton, Andrew Lincoln. The microscopy of vegetable foods, with special reference to the detection of adulteration and the diagnosis of mixtures. New York, London, 1906. *8vo.*

Wytsman, P. Genera avium. Edited by P. Wytsman. *In progress.* Brussels, 1905, *&c. 4to.*

Continuations of the publications of many Scientific Societies, Government Departments and other bodies have been presented as in former years.

RETURN of SCIENCE SCHOOLS and CLASSES to which COLLECTIONS OF SCIENTIFIC APPARATUS have been LENT for INSTRUCTION during the Year 1906.

Name of School.	Subject.	No. of Objects.
Battersea, Southlands Training College	Human Physiology - - -	1
Chelmsford, School of Science and Art.	Machine Construction, Part III.	11
,, ,, ,,	,, ,, Part IV.	8
Merthyr Tydfil, Advanced Elementary Girls' School.	Human Physiology - - -	12
Middlesbrough, Hugh Bell School.	,, ,, ,,	12
Wrexham, School of Science and Art.	,, ,, ,,	2
	Total - -	46

HEATING AND LIGHTING OF THE MUSEUM.

The following table has been prepared from the temperature records taken throughout the year at certain parts of the permanent buildings of the Museum:—

Station.	Diurnal Variation.		Temperature.		
	Max.	Mean.	Min.	Mean.	Max.
	F°	F°	F°	F	F°
Jones Gallery	11	4·15	51	62·88	82
Sheepshanks (South Room)	9	3·46	53	62·83	81
Raphael Gallery	10	3·49	52	62·65	81
Water Colours (N.W. Room)	13	4·66	50	65·46	85
North Court (centre)	10	4·17	53	63·01	76
South Court (East)	8	3·03	53	62.53	77
South East Court	8	2·02	55	62·72	74
Standard in Air	26	11·53	25	52·11	91

The mean temperature for the 8 months during which the Museum was artificially heated was 61·06°; that of the outside air was 46·68°.

The cost of electric current for the Museum and Office buildings, including the Royal College of Art and the old buildings of the Royal College of Science, was £2,930 16s. 6d.; that of carbons for arc-lamps £110 0s. 0d.; and the renewals of glow-lamps £94 10s. 0d. The cost of gas was £1,895 0s. 0d.; and that of gas mantles etc., £9 10s. 0d. These figures include electricity and gas used for power and heating purposes.

BETHNAL GREEN MUSEUM.

The total number of visitors during 1906 was 433,849, which shows an increase of 12,090 as compared with the previous year; the visitors included 1,198 teachers and scholars from schools of the neighbourhood.

Among various objects transferred from the Victoria and Albert Museum the principal were a circulating collection of examples of embroideries of various countries; two plaster sketch models of panels for the decoration of the Albert Memorial, by H. H. Armstead; and a painted cabinet by the late William Morris.

In the early part of the year Lieut.-General Sir Alfred Gaselee, G.C.I.E., lent for a short period a collection of Oriental objects, chiefly in metal; the Curzon Loan Collection of Oriental works of art, referred to in the last Report, was added to, and its arrangement completed in the latter part of 1906.

The Doubleday Collection of Lepidoptera was examined and attended to where necessary by Mr. Richard South.

THE ART MUSEUM RETURNS.

(Including Indian Section.)

(1.) LIST OF CONTRIBUTORS OF LOANS TO THE ART MUSEUM, 1906.

H.R.H. the Prince of Wales.
Eight examples of Tibetan monastic metalwork; 19th century.
Seven examples of Baluchistan embroidery, accoutrements, etc.; 19th century.
Collection of Indian economic woods.

H.R.H. the Princess of Wales.
Two examples of Græco-Buddhist sculpture from Gandhara; 3rd century.
Six examples of Buddhist sculpture and modelling (votive offerings in clay) from Sarnath; about 1000 A.D.

H.R.H. the Prince Edward of Wales.
A representative collection of minerals, rocks and metallurgical specimens from India, including Burma and Baluchistan.

Atkinson, G. M., Esq.
Three pewter spoons. English; 16th century.

Baird, R. G., Esq.
Five pieces of pewter; 17th and 18th centuries.

Bedford, C. H., Esq.
Portion of border of silver lace. Said to have come from Venice. Late 17th century.

Curzon of Kedleston, The Rt. Hon. Lord, G.C.S.I., G.C.I.E., P.C., &c.
A collection illustrating chiefly the art of India, Burma, Nepal and Tibet, together with specimens of the art productions of Turkey, Persia, Afghanistan, Siam and China; also a number of objects connected with the celebration of the Coronation Durbar at Delhi on January 1st, 1903.

Crewdson, W., Esq.
Two Japanese colour print blocks.

DAMES, M. LONGWORTH, ESQ.
Forty-one examples of Græco-Buddhist sculpture from Gandhara; 1st to 3rd century.
Thirty-five miscellaneous objects found when excavating at Bannu and other Græco-Buddhist sites.

DE RUSTAFJAELL, R., ESQ.
Paintings on linen. Egyptian; XVIIIth dynasty.

ELLIS, H. D., ESQ.
Additions to his collection of silver.

FITZHENRY, J. H., ESQ.
Additions to his collection of sculpture, silver, enamels, porcelain and earthenware, etc.

HUDSON, MISS M. B.
Three silver vases and covers. English; 1785–6.
Six specimens of Sheffield plate. 18th century.

JACKSON, C. J., ESQ.
Additions to his collection of silver.

LOVELESS, MRS.
Small silver figure of Gautama Buddha. Sinhalese; 19th century.

MARLING, C. M., ESQ.
Persian earthenware bottle with turquoise-blue enamel.

MORGAN, J. PIERPONT, ESQ.
Additions to his collection of sculpture, silver, enamels, bronzes, earthenware, etc.

MORSE, S., ESQ.
Eleven specimens of silver plate. English; 17th century.

PRICE, F. G. HILTON, ESQ.
Embroidered leather case. Additions to his collection of watches.

SALTING, G., ESQ.
Additions to his collection of bronzes, porcelain and earthenware, etc.

TANNER, MISS E. T.
Silver-gilt cup and cover. English; early 17th century.

VACHER, S., ESQ.
Collection of needle point and pillow-made laces; 16th to 19th century.

WHITEFORD, S. T., ESQ.
Two sauceboats of Plymouth porcelain, dated 1770.

WILLIAMS-WYNN, SIR H. WATKIN, BART.
Painted Sedan chair. From designs by Robert Adam. English; late 18th century.

(2.) LIST OF DONATIONS AND BEQUESTS (EXCLUDING PAINTINGS) DURING THE YEAR 1906.

ALEXANDER, W. C., ESQ.
Five fragments of English stained glass; and four fragments of tiles of the 16th century from Perugia. 436 to 441–1906.

ALLEN, MRS. C. A.
Needlework picture. English; end of 18th century. 277–1906.

ARCHDALE, MRS.
Carrickmacross lace veil, said to have been made in 1816 by Mrs. Grey Porter of Donaghmoyne. 213–1906.

ARMSTEAD, MRS. H. H.
Two plaster sketch-models, by H. H. Armstead, R.A., for the sculptured podium of the Albert Memorial. 178, 179–1906.

ARMSTRONG COLLEGE, (Newcastle-on-Tyne).
Plaster cast of an ornament from a ceiling. 1906–6.

BAKER, S. S., ESQ.
Blue-printed earthenware plate. English; early 19th century. 156–1906.

BENTLEY, MRS. W.
New Hall porcelain plate; about 1800. 387–1906.

BREADALBANE, THE RT. HON. THE MARQUIS OF, K.G., P.C., &c.,
Silver toddy ladle. Perth hall-mark. About 1830. 253–1906.

CHILD, W., ESQ.
Collection of jewellery, Ancient Greek earthenware cup, and German glass barrel. 635 to 643–1906.

COMMITTEE OF THE ST. LOUIS EXHIBITION.
Medal. St. Louis Exhibition, 1904. 442–1906.

COOMARASWAMY, A. K., ESQ.
Carved wood Buddhist monastic school pass. Sinhalese; 17th or 18th century. 214–1906.

COOPER, B. S., ESQ.
Staffordshire porcelain dessert service; first half of 19th century 298 to 303–1906.

CORDWAINERS, WORSHIPFUL COMPANY OF, OF THE CITY OF LONDON.
Plaster decorations and border from ceiling of No. 16, Bishopsgate Street; second quarter of 18th century. 478, 523–1906.

DAVISON, J. W., ESQ.
Heraldic stone carving from Goa. Indo-Portuguese; 17th century. 476–1906.

DE RUSTAFJAELL, R., ESQ.
Coptic stone stand for two water jars. 456–1906.

DILKE, THE RT. HON. SIR C. W., P.C., M.P.
Spanish woollen pile rug, 17th century; and Court train of embroidered satin, French; end of 19th century. 244, 245–1906.

EDEY, MISS H. S.
Printed silk handkerchief, with view of Paris Exhibition, 1855. 46–1906.

EGYPT, BRITISH SCHOOL OF ARCHÆOLOGY IN
Egyptian antiquities, from the excavations of 1905–6. 530 to 583–1906.

EGYPT EXPLORATION FUND.
Egyptian antiquities, from the excavations of 1905–6. 462 to 469–1906.

FARMER, C. B., ESQ.
Three pewter salt-cellars, and one pewter coffee-pot. German; 18th century. 6 to 9–1906.
Collection of Sheffield plate, gold ring, silver gravy spoon, etc. 132 to 138–1906.
Two silver spoons. English and Irish. 176, 177–1906.
Pair of Sheffield plate candlesticks; 18th century. 647–1906.

FITZHENRY, J. H., ESQ.
Three specimens of Chantilly porcelain. 10 to 12–1906.
Carved stone column. Romanesque; 12th century. 47–1906.
Wedgwood vase. 131–1906.
Two panels of a Rood-Screen from Tatterford Church, Norfolk; late 15th century. 271–1906.
Staffordshire salt glaze tea-pot, and Swansea "opaque china" plate. 603, 604–1906.
Two earthenware gable-finials. French (Manerbe); about 1600. 654, 655–1906.

FRERE, SIR BARTLE C. A., BART.
Two pândyi-box panels, with gilt thissi-gum decoration. Upper Burmah; 18th century. 593, 594–1906.

GLINN, MRS.
Collection of coins, etc. Chiefly English. 655 to 897–1906.

GRANT-DUFF, LADY.
Throne-couch of carved wood, gilt and enriched with glass mosaic (thayô work). Taken at the siege of Mandalay in 1886. 205–1906.

GULLAND, W. G., ESQ.
Chinese porcelain vase with coral red glaze. 590–1906.

HARDMAN, LADY.
Three bed-covers or "palampores," of hand-painted cotton. Masulipatam, Madras Presidency; about 1750. 17 to 19–1906.

HARRISON, J., ESQ.
Twenty-five borders of "run" and "tambour" embroidery on net, produced by the stocking-frame machine. Nottingham; late 18th or early 19th century. 20 to 44–1906.

KNIGHT, MRS. M.
Quakeress' silk bonnet. English; middle of 19th century. 461–1906.

LEVIN, M. L., ESQ.
Four flint-locks. 18th century. 49 to 52–1906.

LUND, C., ESQ.
Iron tinder-box in form of netsuké, inlaid. Japanese. 660–1906.

LYONS, LT. COL. G. B. CROFT.
Lambeth "delft" dish and fragment of French earthenware jug; 17th century. 206, 207–1906.
Earthenware drug pot. Dutch; 17th century. 649–1906.

MARLING, C. M., ESQ.
Four specimens of Persian earthenware. 208 to 211–1906.
Portion of "kiswa" or covering for the Kaaba at Mecca. 19th century. 589–1906.

MATTHEWS, MRS. GRANT.
Half of linen damask table-cloth. Flemish; first half of 18th century. 624–1906.

MOORAT, MRS. M. A. C.
Three personal ornaments of cast brass, worn by Kol women of Chota-Nagpur, Bengal; 19th century. 600 to 602–1906.

NAGANO, B., ESQ.
Japanese bamboo flute. 283–1906

NANCEY-HOSSFIELD, MME. B.
Bohemian glass tankard; 19th century. 340–1906.

NATIONAL ART COLLECTIONS FUND, THE.
Two andirons, French; 16th and 17th centuries; Silver medal of the Duke of Lauderdale; Liverpool earthenware plate. 656 to 659–1906.

NEWBERRY, MRS. J. R.
Iron crusie. Scotch; early 19th century. 16–1906.

PATON, MISS.
Baby's knitted cap; made about 1840. 398–1906.

POTTER, MRS. R.
Marble bust, "Eve Disconsolate," by Hiram Powers. 127–1906.

RIOMEI LONGHENA, MME.
Porcelain cup and saucer made at Constantinople. 477–1906.

ROBINSON, SIR J. C., C.B.
Tapestry. Flemish; early 16th century. 375–1906.

ROSENHEIM, MAX., ESQ.
Table clock, French; second half of 16th century; Six bronze medals, and a bronze weight of Toulouse. 379 to 386–1906.

SAVORY, E. W., ESQ.
Two brass lanterns. Dutch ; 18th century. 338, 339–1906.
Pewter coffee-pot, ankard, flagon, spice-box. German ; 17th and 18th century. 325 to 328–1906.

SEDGWICK, CAPT. F. R., R.F.A.
Nineteen brass vessels from Ashanti and Denkara. 180 to 198–1906.

SIMPSON, Mrs. M. E.
Two Græco-Buddhist heads in limestone composition, from Hada, Afghanistan ; about 4th century. 14, 15–1906.

SPIELMANN, SIR I., F.S.A.
Two embroidered velvet rugs. Turkish ; 18th or early 19th century. 399, 400–1906.

TAYLOR, F. C., M.A.
Indian metalwork, textiles, etc. ; 19th century. 305 to 314–1906.

THORP, F. W., ESQ.
Earthenware cinerary urn. Romano-British. 97–1906.

TIPPING, COL. W. FEARON.
Mace, silver and silver-gilt. Italian ; middle of 18th century, with leather case decorated with gilt tooling. 646–1906.

TURNER, MRS. A. S.
Stone chimney piece of the Tudor period. 256–1906.

VACHER, S., ESQ.
Twenty-three embroidered muslin and lace caps. French and English, 18th and early 19th centuries. 221 to 243–1906.
Two embroidered linen caps. Central Asian. 248, 249–1906.
Drug-vase of French earthenware of the 16th century, and tile from Compiègne. 417, 418–1906.
Worcester porcelain plate ; 18th century. 529–1906.

WALLIS, H., ESQ.
Centre of a Syrian earthenware bowl ; 13th century. 377–1906.

WHEATLEY, MRS.
Urns, a pair, of bronze with silver inlay. Japanese ; 19th century. 633–1906.

(3) LIST OF PAINTINGS ACQUIRED DURING THE YEAR BY GIFT.

ERLEBACH, EUSTACE, ESQ., for Nichol Street Ragged Schools, Shoreditch.
Cartoon :—
Alexander Blaikley.
Prince Henry acknowledging the authority of Chief Justice Gascoigne.
Competition Design for decoration in the House of Lords. D. 1020–1906.

MELVILLE, MRS. ARTHUR.
Water-Colour :—
A. Melville, A.R.W.S., A.R.S.A.
The Little Bull Fight—"Bravo Toro!" D. 143–1906.

POLLEN, MRS. J. HUNGERFORD.
Water-Colour :—
J. H. Pollen.
King Henry V. disembarking in the Seine to lay siege to Harfleur.
Sketch for a wall-hanging at Alton Towers. D 10–1906.

WALLIS, THE MISSES KATE AND ROSA.
Oil Painting :—
George Wallis, F.S.A.
The Old Plane Tree formerly on the site now occupied by the New Buildings of the Victoria and Albert Museum, South Kensington. 457–1906.

(4) LIST OF WATER-COLOUR PAINTINGS AND DRAWINGS ACQUIRED BY PURCHASE.

Barry, John. John Walker (miniature on ivory with a stipple engraving of the portrait at the back). 268, 268a–1906.
Batten, John Dickson. St. Christopher and the Christ Child (on plaster). 607–1906.
Beaumont, J. T. Barber. Portrait of a gentleman (miniature on ivory). 269–1906.
Benwell, Miss Mary. Mrs. Bradney (miniature on ivory). 48–1906.
Crossé, Lawrence (Lewis). Miss Wells (miniature on card). 270–1906.
Dixon, Nathaniel. Samuel Pepys (miniature on card). 217–1906.
Downman, John, A.R.A. T. D. Walter. D. 206-1906.
Edridge, Henry, A.R.A. Thomas Hearne. D. 542–1906.
Green, H. Towneley, R.I. An old door at Antwerp. D. 161–1906.
Millais, Sir J. E., Bart., P.R.A. "The Eve of St. Agnes." D. 141–1906.
Moore, Albert, A.R.W.S. Study for the tempera frieze "A Greek Play." D. 1011–1906.
Moore, Henry, R.A., R.W.S. "A Squally Day." D. 1–1906.
Lowestoft. D. 2–1906.
Oakes, J.W., A.R.A. Landscape near Bedford. D. 205–1906.
Pearson, William. View of Chester from the River. D. 162–1906.
Solomon, Simeon. "In the Temple of Venus." D. 142–1906.
Upham, John W. View of Bincombe Church, near Dorchester. D. 144–1906.
View of Preston Church, near Weymouth. D. 145–1906.

ABSTRACT OF OBJECTS ACQUIRED FOR THE ART COLLECTIONS (EXCLUDING CASTS AND ELECTROTYPES) BY PURCHASE OR GIFT, DURING THE YEAR ENDING 31ST DECEMBER, 1906.

Class.	——	Given.	Bought.	Cost.
				£ s. d.
I.	Sculpture in marble, stone, &c.	31	4	45 0 0
II.	Mosaics in stone and glass.	—	—	—
III.	Carvings in ivory, bone, tortoiseshell, &c.	1	6	149 3 0
IV.	Woodwork and furniture.	7	61	685 0 10
V.	Metalwork.	58	59	382 2 3
VI.	Coins and medals.	246	2	2 11 10
VII.	Arms and armour.	5	2	7 7 0
VIII.	Silversmiths' work.	8	16	279 15 8
IX.	Jewellery and goldsmiths' work	10	7	19 6 0
X.	Enamels on metal.	—	7	414 2 10
XIA.	Earthenware and stoneware.	50	51	516 4 0
XIB.	Porcelain.	13	44	221 6 0
XII.	Glass vessels, &c.	11	43	50 0 0
XIII.	Painted and stained glass.	5	3	467 4 4
XIV.	Leatherwork and bookbindings.	—	2	27 17 6
XV.	Textile fabrics and embroideries.	37	61	1,251 5 5
XVI.	Lace.	40	10	85 13 0
XVII.	Musical instruments.	1	1	8 0 0
XVIII.	Paintings in oil, water-colour, &c.	1		176 10 6
	Total.	524	385	4,788 10 2

THE ART LIBRARY RETURNS.

(1) LIST OF DONATIONS AND BEQUESTS DURING THE YEAR 1906.

(a) Books.

AGNEW & SONS, MESSRS. T.

Catalogues of Exhibitions on behalf of Artists' General Benevolent Institution. 1895–1900.

Catalogue of Exhibition of twenty selected pictures of Italian Masters. 1899.

ARANGO, SEÑOR L. M.

Catalogo del Museo del Sr. Arango de Medellin. 1905.

"ART DÉCORATIF" (L'), 24, rue St. Augustin, Paris (per M. J. Bramson).

Regnier (H. de). Esquisses vénitiennes. Avec . . . dessins . . . par M. Dethomas. 1906.

ASHBY, T., ESQ., D. Litt.

Another panorama of Rome by Anton Van den Wyngaerde. (From Mélanges d'archéologie of the Ecole française, Rome, XXVI.) 1906.

ATHENS: Écoles françaises d'Athènes et de Rome.

Colin (G). Le Culte d'Apollon Pythien à Athènes. 1905.

Colin (G.). Rome et la Grèce de 200 à 146 avant Jésus Christ. 1905.

Merlin (A.). L'Aventin dans l'antiquité. 1906.

Samaran (C.) and Mollat (G.) La fiscalité pontificale en France au XIV^e^ siècle. 1905.

BARKER, ALDERMAN W. R., J.P.

The Bristol Museum and Art Gallery, . . . 1772–1906. 1906.

BERLIN: KGL. KUNSTGEWERBE-MUSEUM.

Führer durch . . . das . . . Museum. 14 Aufl. 1907.

BISHOP, HEBER R., ESQ., EXECUTORS OF THE LATE.

New York: Metropolitan Museum of Art. The printed catalogue of the Heber R. Bishop Collection of Jade. By G. F. Kunz. 1906.

BOSTON, MASS.: MUSEUM OF FINE ARTS.

Communications to the Trustees regarding the new building. 4 vols. 1901–06.

Gilman (J. A.). Manual of Italian Renaissance Sculpture, as illustrated in the collection of casts at the Museum. 1904. Two copies.

BROCKLEBANK, R., ESQ.

Carter (R. R.). Pictures and engravings at Haughton Hall, Tarporley, in the possession of R. Brocklebank, Esq. 1904.

BRUSSELS: EXPOSITION DE L'ART ANCIEN BRUXELLOIS.

Destrée (J.). Tapisseries et sculptures bruxelloises. 1906.

CARY, CLARENCE, ESQ.

Catalogue of various archaic and other Chinese bronzes, including a specimen of Mohammedan blue porcelain. 1906.

CHRISTCHURCH: NEW ZEALAND INTERNATIONAL EXHIBITION, 1906–07 (BRITISH GOVERNMENT COMMITTEE).

British Government Exhibit. Official catalogue. 2 vols. 1906.

CHURCHILL, S. J. A., ESQ., M.V.O.

L'apertura della tomba di Carlo Magno. (Excerpt from Giornale di Sicilia, 24-25 July 1906.) 1906.

Municipio di Ascoli Piceno. Libro verde sul ricupero del Piviale di Nicilo IV^o^. 1906.

CLOUZOT, M. A.

A. Jacquard et les graveurs poitevins. 1906.

CONTON, DR. LUIGI.
I più insigni monumenti di Ennione, recentemente scoperti nell' agro Adriese. 1906.

COOK, HERBERT F., ESQ.
Abridged catalogue of the pictures at Doughty House, Richmond. [Collection of Sir Frederick Cook, Bart.] 1903.

COOMARASWAMY, DR. A. K.
Kandyan horn combs. 1905.
The "Ceylon National Review," No. 1, Jan., 1906.

"DAILY MAIL," PUBLISHERS OF THE.
The "Daily Mail" Year Book for 1906.

DAY, MRS. C. R.
Manuscript and proofs of "The music and musical instruments of Southern India and the Deccan," by the late Major C. R. Day. With correspondence on the subject, 6 (5 col.) drawings, 5 chromo-photo-lithogr. proofs, 1 photogr. and music scores. 1888–98.

DILKE, RT. HON. SIR CHARLES WENTWORTH, BART., M.P., AND THE LATE LADY DILKE.
Textus Biblie. Cuts. Fol. Lugduni, J. Crespin, 1529.

EDINBURGH: SOCIETY OF ANTIQUARIES OF SCOTLAND.
Proceedings. Vol. 39. 1904–05.

FARRER, LADY.
Correspondence of Josiah Wedgwood, 1781–1794.

FISHER, J. A., ESQ.
Bazeley (Rev. W.). Descriptive and archæological notes on the Tudor carvings recently discovered in an ancient mansion, now 163, Westgate Street, Gloucester. 1893.
Burrow (E. J.). The Severn lands. Gloucester and Dean Forest. n.d.

FRANCE: MINISTÈRE DE L'INSTRUCTION PUBLIQUE.
Inventaire général des richesses d'art de la France. Province. Monuments civils, tome VII. 1905.

FRANKFORT ON THE MAIN: FREIHERRLICH CARL VON ROTHSCHILD'SCHE ÖFFENTLICHE BIBLIOTHEK.
Verzeichniss der laufenden Zeitschriften. 1905.

GLINN, MRS.
Bradley (J.W.). Manual of illumination. 1861.

GREAT BRITAIN: SOCIETY OF ART MASTERS.
Papers read at the annual meeting of the Society. 1906.

GREECE: GOVERNMENT OF.
Comptes-rendus du Congrès international d'archéologie, Athènes, 1905.

GUEST, A. R., ESQ.
Arabic inscriptions on textiles at the South Kensington Museum. 1906.

HANNOVER, HERR EMIL.
De Spansk-Mauriske og de første Italienske Fayencer. 1894.

HART, J., ESQ.
Illustrated guide to the Church Congress and Ecclesiastical Art Exhibition, Weymouth, 1905.

HUNGARY: GOVERNMENT OF.
Ney Pilisi (B.). Das ungarische Parlamentshaus, von E. Steindl. 1906.

HURST AND BLACKETT, MESSRS.
Binns (W. Moore). The first century of English Porcelain. 1906.

INDIA: GOVERNMENT OF.

Annual progress report of the Archæological Surveyor, United Provinces and Punjab, for the year ending 31st March 1905.
Photographs and drawings referred to in the . . . Report. 1905.
Archæological Survey of India. Annual report, 1903–04. 1906.

JONES, E. ALFRED, ESQ.

The silver altar of Pistoia Cathedral. 1906.

KLEINSCHMIDT, REV. BEDA, O.F.M.

Das Rationale in der abendländischen Kirche. 1905.
Der liturgische Kamm. Eine kunstarchäologische Studie. 1905.
Das Rationale zu Paderborn. 1905.

LEGA-WEEKES, MISS E.

Neighbours of North Wyke. Parts 1, 2 and 4. 1901–04.
Neighbours of North Wyke. Part 5, Ash and South Zeal in South Tawton. 1905.
The Mohun chronicle at Haccombe. 1906.
The churchwardens' accounts of South Tawton. 1906.

LIVERPOOL: CORPORATION (COMMITTEE OF THE LIBRARY AND MUSEUM).

Catalogue of the Art Library bequeathed by Hugh Frederick Hornby to the Free Public Library of the City of Liverpool. 1906.

LONDON: AUSTRIAN EXHIBITION, EARL'S COURT (per Herr Schwarz).

Catalogue (3 copies), and Catalogue of the Fine Arts. 1906.

LONDON: BRITISH MUSEUM.

Colvin (S.). Early engravers and engraving in England. 1905.
Crum (W. E.). Catalogue of Coptic manuscripts. 1905.
Douglas (Sir R. K.). Catalogue of Japanese books and manuscripts. 1899–1903.
Hall (H. R. H.). Coptic and Greek texts. 1905.
Hobson (R. L.). Catalogue of English Porcelain. 1905.
Margoliouth (Rev. G.). Catalogue of Hebrew and Samaritan manuscripts. Part 2. 1905.
Smith (A. N.). Catalogue of the sculptors of the Parthenon. 1906.
Medallic illustrations of the history of Great Britain and Ireland. 5 parts. 1904–06.
Reproductions of Prints, new series, part XV. 1906.
Guide to the Babylonian and Assyrian rooms. 1900.
Guide to the third and fourth Egyptian rooms. 1904.
Guide to the antiquities of the Early Iron Age. 1905.
Guide to the manuscripts, autographs, etc., exhibited. 1906.

LONDON: BURLINGTON FINE ARTS CLUB.

Catalogue of an exhibition of pictures and sketches by Charles Wellington Furse, A.R.A. 1906.
Exhibition of Early German Art. [Catalogue.] 1906.

LONDON: COUNTY COUNCIL.

Gomme (G. L.). No. 17, Fleet Street. 1906.

LONDON: ST. BRIDE'S FOUNDATION INSTITUTE.

Examples of work, etc. 1905–06.

LONGMAN, T. NORTON, ESQ.

A description of the Wordsworth and Coleridge manuscripts in the possession of Mr. T. N. Longman. Edited by W. Hale-White. 1897,

MACGIBBON, A. L., ESQ.

Goodyear (W. H.). A reply to the article in "The Builder" of September 23rd, 1905, entitled "The glamour of crooked building."

MARQUET DE VASSELOT, MONSIEUR J. J.

Les émaux limousins à fond vermiculé (XII^e^ et XIII^e^ siècles). 1906.

OXFORD: EXHIBITION OF HISTORICAL PORTRAITS, 1906.
Catalogue of a loan collection of portraits of English historical personages who died between 1714 and 1837. 1906.

PARIS: PRÉFECTURE DU DÉPARTEMENT DE LA SEINE.
Histoire générale de Paris. Coyecque (E.). Recueil d'actes notariés, . . . XVI^e siècle, vol. I. 1905.
Histoire générale de Paris. Camperdon (E.) and Tuetey (A.). Inventaire des registres des insinuations du Châtelet de Paris. Règnes de François Ier et de Henri II. 1906.

PENHALLOW, C. S., ESQ.
The Penhallow panels (from Clifford's Inn, and now in the Museum). 1905.

PERCIVAL, S. G., ESQ.
Brislington copper lustre ware. 1906.

PICCIRILLI, SIGNOR P.
Oreficeria medievale Aquilana. Due cimeli nel Victoria and Albert Museum. 1905. 2 copies.

QUARRÉ-REYBOURBON, M. L.
Alphonse Colas, peintre d'histoire, 1818–1887. 1904.

SAINT LOUIS: EXHIBITION, 1904 (BRITISH ROYAL COMMISSION).
Report of His Majesty's Commissioners. 1906.
Spielmann (Sir I.) The British Section. 1906.

SAVORY, E. W., ESQ.
Moore (N. Hudson). Old pewter, brass, copper and Sheffield plate. 1905.

SIMPSON, MRS. W.
Hoernle (A. F. R.). Description of the gold coins and relics found . . . in the Ahin Posh Tope, Jelalabad. 1879.

STOCKHOLM: KONGL. VITTERHETS HISTORIE OCH ANTIQVITETS AKADEMIEN.
Almgren (O.). "Kung Björns hög" och andra fornlämningar vid Haga, . . . undersökta 1902–3. 1905.

STOCKHOLM: NATIONALMUSEI KONSTSAMLINGAR.
Vagledning i Konstslojdafdelningen. 7 ed. 1906.

STORK, DR. MAX.
St. Jörg am Oberrhein. (Beilage zum Jahresbericht der Oberrealschule, Freiburg, 1904–05.) 1905.

TAYLOR, F. COSTON, ESQ.
Rousselet (L.). India and its native princes. 1878.
Taylor (R.). The princely armory, being a display of the arms of the ruling chiefs of India. 1902.
Waring (J. B.). Masterpieces of industrial art. 3 vols. 1863.
Wheeler (J. T.). The history of the Imperial Assemblage at Delhi; 1877. (1878.)

THOMAS, RALPH, ESQ.
Six cancelled pages of "Catalogue of the etchings and drypoints of J. A. Macneil Whistler." 1874.
Serjeant Thomas and Sir J. E. Millais. 1901.

TORONTO: CANADIAN NATIONAL EXHIBITION (per Dr. J. O. Orr).
Catalogue of Department of Fine Arts. 1904–05.

VILLAHERMOSA, DUCHESS OF.
Album Cervantino Aragonés de los trabajos literarios y artisticos, con que se ha celebrado en Zaragoza y Pedrola el III. centenario de la edición principe del Quijote. 1905.

WARDLE, GEORGE, ESQ.

Adinolfi (P.). Roma nell' età di mezzo. 2 vols. 1881.
Allard (P.). L'art païen sous les empereurs chrétiens. 1879.
Bayet (C.). L'art byzantin. New ed. n.d.
Castellani (A.). Dell' oreficeria antica. 1862.
Cattaneo (R.). L'architettura in Italia dal secolo VI. al mille circa. 1888.
Cavallucci (C. J.). S. Maria del Fiore. Storia documentata. 1881.
Cellini (B.). Vita . . . scritta da lui medesimo. Ed. F. Tassi. 2 vols. 1829.
Corsi (F.). Delle pietre antiche. 3 ed. 1845.
Eastlake (Sir C. L.). Sopra la storia della pittura ad olio. Trad. da G. A. Bozzi. 1849.
Fratini (G.). Storia della basilica e del convento di S. Francesco in Assisi. 1882.
Grassi (R.). Descrizione storica e artistica di Pisa e de' suoi contorni. 3 vols. 1836–38.
Lenormant (F.). Monnaies et médailles. New ed. n.d.
Lenormant (F.). A travers l'Apulie et la Lucanie. 2 vols. 1883.
Malvezzi (L.). Le glorie dell' arte lombarda . . . dal 590 al 1850. 1882. (With MS. notes, 6 ff.)
Mandeville (Sir J.). Viaggi di Gio. da Mandavilla. . . . Per cura di F. Zambrini. 2 vols. 1870.
Micali (G.). Storia degli antichi popoli italiani. 3 vols. 1835–36.
Mignanti (F. M.). Istoria della . . . Basilica Vaticana. 2 vols. and atlas. 1867.
Nibby (A.). Analisi . . . della carta de' dintorni di Roma. 2 ed. 3 vols. and atlas. 1848–49.
Nibby (A.). Roma nell' anno 1838. 4 vols. 1838–41.
Paparrigopoulo (K.). Histoire de la civilisation hellénique. 1878.
Pératé (A.). L'archéologie chrétienne. 1892.
Perkins (C. C.). Les sculpteurs italiens . . . Ouvrage traduit de l'Anglais par C. P. Haussoullier. Tome I. 1869.
Procopius, of Cæsarea. Opere di Procopio di Cesarea. 1828.
Santi (Raffaello). Lettera sulle antichità di Roma. 1834.
Zirardini (A). Degli antichi edifizi profani di Ravenna. 1762.

WASHINGTON, U.S.A.: LIBRARY OF CONGRESS.

Report of the Librarian of Congress, and Report of the Superintendent of the Library building and grounds. 1905.

WOOLNOUGH, F., ESQ.

A short history of the mansion and estate of Christchurch, Ipswich. 1904.
Ye Ancient House att Ipswich. 1905.

The Transactions of certain societies have been presented as heretofore, and new catalogues and other publications have been received from various museums.

(b) Prints and Drawings.

ANDRÉ AND SLEIGH, MESSRS.

"The Building and Vegetable," reproduced by three-colour process for "English Coloured Books." 5 sheets of proofs.
Reproduction by three-colour process of a painting by Sir E. Burne Jones. 5 sheets of proofs.

BROWN AND BIGELOW, MESSRS.

Specimens (7) of Process Engraving.

BURGESS, W. W., ESQ.

Book-plate of the Metropolitan Borough of Chelsea Public Library; and of the City of Westminster Public Libraries. Designed by W. W. Burgess.

DURNING-LAWRENCE, SIR EDWIN, BART.
2 water-colour drawings by William Blake.
13 drawings of male and female heads by G. B. Piazzetta.

FANMAKERS, THE WORSHIPFUL COMPANY OF.
5 designs for fans in water-colour on silk.

GLINN, MRS. HELEN.
Album containing 142 tracings and drawings of illuminated letters, etc., from ancient MSS. in Hereford Cathedral Library. By Miss Johnson.

GOULDING, F., ESQ.
Collection of 76 proofs of lithographs by British artists.
6 etchings by F. Goulding.

HANKEY, W. LEE, ESQ.
18 coloured etchings by W. Lee Hankey.

HUNTER, J. YOUNG, ESQ.
14 etchings by Colin Hunter, A.R.A.

LINCOLN COLLEGE, OXFORD.
Book-plate for Lincoln College Library, Oxford. Etched by Muirhead Bone.

LUKER, F. M., ESQ.
6 cartoons and a sheet of patterns by Albert Moore.

PARIS : PRÉFECTURE DU DÉPARTEMENT DE LA SEINE
Engravings (2) of decorative panels in the Hôtel de Ville, Paris ; and "L'Amateur d'Estampes," after H. Daumier.

ROSS, REV. J. A.
Book-plate of James Alfred Ross. Designed by Graham Johnston.

SIMPSON, MRS. M. E.
Volume containing 125 drawings of crosses, by W. Simpson, R.I., with 22 prints and 20 photographs.
11 sheets of drawings of Buddhist architecture near Jellalabad, by W. Simpson, R.I.

"TRIBUNE," MANAGING EDITOR OF THE.
Pen drawing of the New Victoria and Albert Museum Buildings, by Louis Weirter.

WALLIS, MISS K.
6 etchings by George Wallis, F.S.A.

WALLIS, GEORGE, EXECUTORS OF THE LATE.
Specimens illustrating the process of auto-typography, invented by G. Wallis, F.S.A. Two volumes, 1859–60.

PHENÉ SPIERS COLLECTION OF DRAWINGS OF ARCHITECTURE.

Plans, elevation, section and details of mouldings of a bay on the North Side of the Choir of Westminster Abbey. 4 sheets.
Drawn and presented by Sydney Vacher, Esq., A.R.I.B.A.

Plan and details of the entrance to the Chapter House, Westminster Abbey. 2 sheets.
Drawn and presented by F. G. Knight, Esq., F.R.I.B.A.

Plans, elevations, sections and details of the "Olde Oake House," West Bromwich. 12 sheets.
Drawn and presented by W. Curtis Green, Esq., A.R.I.B.A.

Plans, elevations, sections and details of the Thersilion, Theatre, Temenos of Zeus Soter, and Stoa of Philip at Megalopolis. 16 sheets.
Drawn and presented by R. W. Schultz, Esq. Sheet No. 1 was partly drawn by Mr. W. Loring ; Nos. 4 and 5 were partly drawn by Mr. W. Stirling ; No. 9 was drawn by Mr. S. H. Barnsley.

Elevations of the Guildhall, Guildford. 2 sheets.
Drawn and presented by R. W. Schultz, Esq. The building was partly measured by Mr. H. Read.

Plans, elevation, section and details of the Ward School, Botolph Lane, Eastcheap, E.C. 2 sheets.
Drawn by A. E. Bullock, Esq., A.R.I.B.A.; presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Plans, section and details of the Chantry of King Henry V. in Westminster Abbey. 3 sheets.
Drawn and presented by G. T. McCombie, Esq.

Elevations and details of H.M. Prison, Newgate. 3 sheets.
Drawn by G. J. J. Lacy, Esq.; presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Plans, section and details of St. Stephen's Church, Walbrook, E.C. 5 sheets.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Plan, sections, details and perspective view of interior of St. James's Church Piccadilly. 5 sheets.
Drawn and presented by L. Wilkinson, Esq.

Plan, elevations, sections and details of the North-West Chapel in St. Paul's Cathedral. 5 sheets.
Drawn and presented by T. H. Watson, Esq.

Plans, elevations, details and perspective view of exterior of Eastbury Manor House, Essex. 6 sheets.
Drawn and presented by W. L. Spiers, Esq., A.R.I.B.A.

Plans, elevation, section and details of the North Porch of St. Paul's Cathedral. 4 sheets.
Drawn and presented by R. W. Schultz, Esq.

Plans, elevation and sections of passage between Cloisters and Chapter House, and of the Entrance to Chapter House, Westminster Abbey. 3 sheets.
Drawn and presented by E. J. Milner Allen, Esq., A.R.I.B.A.

Plan of the Church of La Trinité, Caen.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Plans, elevations, sections and details of Shottesbrooke Church, Berks. 11 sheets.
Drawn and presented by Arnold B. Mitchell, Esq., F.R.I.B.A.

Plans, elevations, sections and details of Layer Marney Towers, Essex. 8 sheets.
Drawn and presented by Arnold B. Mitchell, Esq., F.R.I.B.A.

Plan, elevation, sections and details of the Choir Screen, Southwell Cathedral. 4 sheets.
Drawn and presented by H. Carter Pegg, Esq, F.R.I.B.A.

Elevations and details of the Strand front of Somerset House. 6 sheets.
Drawn and presented by Henry Hall, Esq., F.R.I.B.A.

Plans, elevations, section and details of the Screens and Stalls in the Choir of St. Paul's Cathedral. 2 sheets.
Drawn and presented by W. Wonnacott, Esq.

Plan, elevations, sections and details of the Great Hall, Hampton Court Palace. 6 sheets.
Drawn and presented by W. Wonnacott, Esq.

Plans, elevations and details of Kirby Hall, Northants. 4 sheets.
Drawn and presented by M. Starmer Hack, Esq., A.R.I.B.A.

Plan of the Cité of Carcassonne.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Plan of the Château at Coucy-le-Château.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Plan, elevations, sections and details of the Banqueting Hall, Kensington Palace. 5 sheets.
Drawn and presented by G. Weald, Esq.

Plans, sections and details of the Inlaid Chamber, Sizergh Castle. 2 sheets.
Drawn and presented by F. Dare Clapham, Esq., A.R.I.B.A.

Plan and Perspective view of the Staircase in the South-West Tower, St. Paul's Cathedral.
Drawn and presented by R. Stephen Ayling, Esq., F.R.I.B.A.

Plans, elevations, sections and details of the Wall Arcading of the Lady Chapel, Ely Cathedral. 3 sheets.
Drawn and presented by L. Stokes, Esq., F.R.I.B.A.

Elevation and details of Wolvesey House, Winchester. 3 sheets.
Drawn and presented by L. G. Detmar, Esq., A.R.I.B.A.

Mural paintings on the north wall of Nave, Pickering Church, Yorks. 2 sheets.
Drawn and presented by A. H. Powell, Esq.

View of Beckington Chantry, Wells Cathedral.
Drawn and presented by A. H. Powell, Esq.

Portion of decoration on screen, Trunch Church.
Drawn and presented by A. H. Powell, Esq.

Portion of decoration on screen, Southwold Church.
Drawn and presented by A. H. Powell, Esq.

View of the North Porch of St. Lawrence's Church, Nuremberg.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

View of part of the Cloisters, Erfurt Cathedral.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Elevations of parts of the Choir Stalls, Erfurt Cathedral.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Details of the Tomb of Cardinal Hæmardus, Amiens Cathedral. 2 sheets.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Plan, elevation, section and details of arcading in Cloisters, Aix-la-Chapelle Cathedral.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Plan, elevation, section and details of the entrance to the Lady Chapel, Abbey of St. Bavon, Ghent.
Drawn and presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Plan of Lincoln Cathedral.
Drawn and presented by A. Beresford Pite, Esq., F.R.I.B.A.

Plan, elevations, sections and details of Iffley Church. 10 sheets.
Drawn by H. G. W. Drinkwater, Esq.; presented by G. C. Drinkwater, Esq.

Elevation and details of H.M. Prison, Newgate. 3 sheets.
Drawn and presented by G. Weald, Esq.

Plans, elevations and sections of the Embankment arch and river approach to Waterloo Bridge. 3 sheets.
Drawn and presented by H. C. R. Hide, Esq.

Elevation of screen round Tomb of Henry VII., Westminster Abbey.
Drawn and presented by F. L. Pither, Esq.

Transfer prints of plans, elevations and sections (7) of the Chateau de Pierrefonds. From the original drawings by E. E. Violle-le-Duc. Coloured by hand.
Presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

Four Photographs of the Ward School, Botolph Lane, E.C.
Presented by B. T. Batsford, Esq.

Thirty-two Photographs of Architecture.
Presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

A copy of Vol. II., 1887, of the Glasgow Architectural Association Sketch Book.
Presented by R. Phené Spiers, Esq., F.R.I.B.A., F.S.A.

(c) Photographs.

Messrs. Asher & Co., 1 ; Königliche Museen, Berlin, 4 ; Messrs. Brucciani, 2 ; Alan S. Cole, Esq., C.B., 90 ; H. W. Fincham, Esq., 1; Sir Bartle C. A. Frere, 3 ; R. Martin Holland, Esq., 1 ; C. E. Keyser, Esq., 21 ; Herr Langhans, 812 ; Ivor McClure, Esq., 4 ; Kunstgewerbliches Museum, Prague, 1 ; Mrs. M. E. Simpson, 20 ; R. Phené Spiers, Esq., F.R.I.B.A., F.S.A., 75 ; R. Coston Taylor, Esq., 362 ; Committee of the Canadian National Exhibition, 1906, Toronto, 33 ; G. Tucker, Esq., 24.

(2.) Reading Room Returns.

——	1902.	1903.	1904.	1905.	1906.
Attendances of Readers (A.L.)	17,604	16,724	17,708	19,470	17,134
Works consulted (A.L.)	34,303	36,811	38,221	42,680	62,797
Attendances of Readers (Dyce and Forster L.)	498	335	238	354	295
Works consulted (Dyce and Forster L.)	1,728	1,105	1,002	1,447	1,546

(3.) Abstract of Acquisitions for the Art Library, by Purchase or Gift, during the Year ending 31st December, 1906.

Class.	——	Given.	Bought.	Cost.		
				£	*s.*	*d.*
I.	Books - - - - -	579	1,553	1,222	17	1
II.	Manuscripts - - -	—	1	6	15	0
III.	Drawings - - - -	467	728	390	16	10
IV.	Prints - - - - -	183	372	118	9	3
V.	Photographs * - - -	1,548	1,579	222	14	0
		2,777	4,233	1,961	12	2

* 354 Photographs from official negatives were also received.

(4.) Transfers and Loans.

——	Volumes.	Drawings.	Prints.	Photographs.
Transferred to Circulation -	42	128	—	126
Lent to Circulation, to other Divisions or to Students -	1,484	437	487	2,145

CIRCULATION RETURNS.

(1.) RETURN of PROVINCIAL MUSEUMS and EXHIBITIONS to which ART COLLECTIONS and SCIENTIFIC OBJECTS have been contributed during the YEAR 1906, showing NUMBER of OBJECTS, &c., Lent, VISITORS, and RECEIPTS.

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
						£ s. d.
Accrington	January to December	112	36	309	15,646	Free
Alexandra Palace	January to December	99	—	—	—	—
Bath	January	143	29	192	34,391	3 4 4
"	February to December	76	6			
Belfast	January to March	99	25	303	284,946	Free
"	March to December	164	36			
Birmingham	January to December	184	—	363	416,776	Free
Blackburn	January to December	146	31	322	64,500	Free
Blackpool	January to December	18	45	—	—	—
Bolton, Mere Hall	January to December	87	137	241	38,654	Free
Bootle	January to December	160	159	287	30,795	Free
Bradford	June to December	19	69	—	—	—
Bristol	January to October	128	293	335	360,919	Free
"	October to December	101	5			
Burnley	January to December	75	—	—	—	—
Burslem	January to December	167	60	305	18,457	Free
Bury St. Edmunds	January to December	67	27	306	6,251	12 2 8
Buxton	January to December	104	41	310	5,983	Free
Camberwell	January to December	201	177	—	—	—
Canterbury	January to July	88	—	—	—	—
"	July to December	85	—			
Cardiff	January to May	73	40	—	—	—
"	May to December	48	12			
Carlisle	January to December	158	409	310	26,985	Free
Chelmsford	February to December	147	11	268	16,123	Free
Cheltenham	January to December	85	119	298	12,787	Free
"	December	158	189			
Chester	January to December	63	43	313	11,079	28 9 0
Cork	January to June	80	40	—	—	—
"	June to December	148	23			
Darwen	January to December	54	17	—	—	—
Derby	January to March	106	37	287	300,674	18 16 11
"	March to December	99	22			
Devonport	January to December	103	49	310	25,963	Free
Dewsbury	January to December	10	25	—	—	—
Dover	January	119	33	185	18,798	Free
"	January to December	135	25			
Dublin	January to December	306	25	—	—	—

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
						£ s. d.
Dundee, Albert Institute	January to December	188	229	364	287,880	Free
Dundee, Dudhope Park	January to December	88	41	364	136,415	Free
Eastbourne	January to December	117	—	—	—	—
Edinburgh	January to December	1,457	257	—	—	—
Exeter	January to December	130	15	313	71,517	Free
„	December	163	9			
Folkestone	January to December	111	11	313	21,739	Free
Glasgow, Kelvingrove	January to March	117	1	365	800,190	Free
Glasgow, People's Palace	January to December	147	153	365	325,603	Free
„	December	111	72			
Glasgow, Camphill House	March to December	120	33	365	63,649	Free
Glasgow, Tall Cross	January to December	94	—	365	113,064	Free
„ „ „	December	84	—			
Greenock	January to December	94	15	262	14,683	Free
Halifax	January to December	80	29	313	67,176	Free
Hanley	January to December	184	33	253	30,849	Free
„	December	191	36			
Hastings	January to March	250	35	—	—	—
„	March to December	99	—			
Hull	January to June	85	57	311	108,568	Free
„	June to December	116	45			
Ipswich	January to December	80	69	—	—	—
Keswick	January to December	69	19	313	1,672	35 7 8
Kidderminster	January to June	104	26	—	—	—
„	July to December	89	8			
King's Lynn	January to December	84	31	305	7,570	Free
Leeds	January to December	119	4	312	287,028	197 1 0
Leek	January to December	275	301	275	6,553	Free
„	December	138	8			
Leicester Art Gallery	January to October	45	—	363	133,652	Free
„ „ „	October to December	45	—			
Leicester School of Art Museum	January to December	191	170	—	—	—
Lichfield	January to December	6	42	309	13,306	Free
Lincoln	January to December	95	36	259	1,691	Free
Macclesfield	January to May	83	16	308	5,628	Free
„	May to December	66	14			
Maidstone	January to December	108	—	309	96,026	Free
Manchester School of Art Museum	January and February	198	67	213	7,276	Free
„	February to December	121	70			
Manchester, Queen's Park	January to December	103	—	364	136,178	Free
Middlesbrough	January to December	113	25	230	71,615	Free
Newcastle-upon-Tyne	January to November	231	295	—	—	—
„ „	November and December	184	—	—	—	—

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
						£ s. d.
Newport (Mon.) -	January and February -	90	39	301	31,516	Free.
" " -	February to December -	145	11			
Northwich - -	January and February -	63	14	—	—	—
Nottingham - -	January to December -	71	—	238	261,519	229 4 0
Oldham - - -	January to December -	173	258	307	98,473	Free.
Paisley - - -	January to May - -	84	10	308	99,975	Free.
" - - -	June to December -	201	10			
Perth - - -	January to May - -	90	192	309	41,283	Free.
" - - -	June to December -	140	32			
Plymouth - -	January to August -	84	40	363	27,540	Free.
" - -	September to December	108	27			
Poole - - -	January to December -	225	65	312	2,554	Free.
Portsmouth - -	January to April - -	96	6	306	34,310	Free.
" - -	May to December - -	225	65			
Preston - - -	January to June - -	116	18	364	84,542	Free.
" - - -	June to December -	116	43			
Reading - - -	January and February -	103	97	310	88,249	Free.
" - - -	March to December -	90	97			
Rochdale - - -	January to December -	101	—	298	61,044	Free.
Rochester - -	January to December -	34	—	311	26,388	Free.
Rotherham - -	January to May - -	136	30	310	62,409	Free.
" - -	May to December -	200	122			
Rugby - - -	January to June - -	99	38	81	10,063	Free.
" - -	June to December -	96	53			
St. Albans - -	January to December -	130	19	258	9,950	Free.
Salford - - -	January to June - -	182	3	313	106,894	Free.
" - - -	July to December - -	83	—			
Sheffield Mappin Art Gallery, Weston Park - - -	January to December -	109	—	312	252,588	Free.
Sheffield, High Hazels	January to December -	63	26	364	43,702	Free.
Stockport - -	January to April - -	79	6	358	58,616	Free.
" - -	April to December -	82	6			
Stoke-upon-Trent -	January to December -	181	39	—	—	—
" " " -	December - - -	121	56			
Sunderland - -	January to December -	104	100	302	116,973	3 12 7
Truro - - -	January to December -	159	37	301	22,380	Free.
Tunstall - - -	January to April - -	244	65	308	13,667	Free.
" - - -	April to December -	277	20			
Walsall - - -	January to November -	70	48	—	—	—
Warrington - -	January to December -	97	—	212	24,295	Free.
Wednesbury - -	January to October -	69	37	313	14,791	Free.
" - -	October to December -	118	29			
West Bromwich -	January to September -	180	33	365	32,011	Free.
" - -	September to December	137	43			
Weston-super-Mare -	January to December -	119	44	312	11,729	Free.
Wolverhampton -	January to December -	184	145	362	127,099	Free.
Worcester - -	January - - - -	85	27	312	68,800	Free.
" -	January to December -	219	101			
Yarmouth - -	January to December -	85	—	299	39,232	Free.
York - - -	January to December -	128	35	180	6,468	Free.

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
						£ s. d.
Exhibitions:						
Arbroath	March to June	—	160	—	—	—
*Batley	September	32	170	—	—	—
*Belfast	September	32	170	—	—	—
Berkhamsted	June	60	3	—	—	—
Brighton	January to April	—	101	—	—	—
Carmarthen	September and October	185	48	—	—	—
Cirencester	April and May	15	—	—	—	—
*Coventry	October	32	170	—	—	—
Galway	August and September	47	16	—	—	—
Jamaica, Institute of	February to December	—	64	—	—	—
Kingston	January to March	20	84	—	—	—
Lincoln	November and December	118	121	—	—	—
London:						
Architects, International Congress of	July	—	32	—	—	—
Battersea	September to November	—	30	—	—	—
Bermondsey	May and June	—	17	—	—	—
Burlington Fine Arts Club	April to August	31	—	—	—	—
Sculptors and Gravers, International Society of	January to April	—	7	—	—	—
West Ham	January to April	—	47	—	—	—
Whitechapel	January	2	76	—	—	—
,,	March to May	98	11	—	—	—
,,	October to December	21	22	—	—	—
Milan	March to December	—	21	—	—	—
Munster	June to November	—	6	—	—	—
New Zealand	August to December	36	73	—	—	—
Shrewsbury	April and May	67	—	—	—	—
South Shields	September and October	—	48	—	—	—
*Sunderland	October	32	170	—	—	—
Toronto	July to October	—	4	—	—	—
*Warrington	September and October	32	170	—	—	—
Workington	January and February	408	134	—	—	—
Lectures:						
Art Workers Guild	February	—	12	—	—	—
,, ,,	May	—	64	—	—	—
,, ,,	October	13	—	—	—	—
,, ,,	November	15	—	—	—	—
Society of Arts	April	20	—	—	—	—
,, ,,	May	—	63	—	—	—
,, ,,	December	16	—	—	—	—
Lantern slides lent to 63 Schools of Art and other Institutions.		—	2,185	—	—	—
Provincial Museums		16,884	6,655	—	—	—
Exhibitions		1,236	1,884	—	—	—
Lectures, &c.		64	2,324	—	—	—
Total		18,184	10,863	—	—	—

* These Exhibitions consisted of a selection of the prize works executed by students for the National Art Competition.

(2.) Return of Schools of Art and Art Classes, to which Objects, Paintings, Drawings, Photographs and Books have been Lent for the purposes of Study during the Year 1906.

Name of School.	Objects.	Paintings, Drawings, Photographs.	Books.
English Schools, etc. :—			
Acton and Chiswick	69	76	4
Accrington	17	3	—
Ashton-under-Lyne	19	36	4
Aston Manor	34	25	—
Bakewell	—	2	—
Banbury	16	13	—
Barnstaple	—	52	—
Barrow-in-Furness	15	1	4
Barwell	—	3	—
Bath	62	50	7
Batley	13	26	4
Beckenham	—	94	7
Bedford	—	5	—
Bideford	15	1	7
Bingley	—	1	4
Birkenhead	17	14	—
Birmingham, Central	155	109	—
,, Moseley Road	—	13	—
,, Vittoria Street	83	41	—
Bishops Stortford	—	52	—
Blackburn	80	96	—
Bolton	159	160	5
Bootle	—	1	—
Bournemouth, East	—	12	—
,, West	17	17	2
Bradford, Church Institute	16	—	—
,, Grammar School	—	13	—
,, Mechanics' Institute	15	2	—
,, Technical School	251	58	5
Bridgwater	18	75	—
Bridport	15	—	—
Brighton	92	89	—
Brimscombe	—	13	—
Bristol, Kensington House	15	14	—
,, Queen's Road	40	—	—
Bromley	44	69	7
Burnley	15	40	5
Burslem	17	20	—
Burton-on-Trent	48	56	—
Bury	—	15	—
Bury St. Edmunds	—	1	6
Camborne	14	14	—
Cambridge	16	1	—
Canterbury	40	15	3
Cardiff	—	14	1
Carlisle	16	15	—
Carmarthen	16	10	9
Chelmsford	135	428	19
Cheltenham	33	67	—
Chester	14	13	8

Name of School.	Objects.	Paintings, Drawings, Photographs.	Books.
Chesterfield	17	14	—
Chichester	15	17	4
Chippenham	15	—	—
Chipping Campden	369	589	8
Cirencester	16	—	—
Coalbrookdale	22	122	—
Colchester	115	203	14
Colne	—	21	—
Coventry	17	13	—
Crewe	—	13	10
Croydon	38	33	11
Darwen	45	45	—
Denbigh	—	3	—
Denton	—	20	—
Derby	46	52	2
Devizes	16	—	—
Devonport	16	12	3
Dewsbury	—	13	—
Dorchester	70	7	4
Dover	101	28	4
Dudley	15	—	—
Dukinfield	—	15	—
Durham	16	2	—
Ealing	24	46	17
Eastbourne	263	52	5
Epsom	—	—	5
Exeter	—	22	—
Farnham	28	17	4
Fenton	—	—	5
Folkestone	6	25	—
Gainsborough	—	5	—
Gloucester	16	5	3
Godalming	—	68	—
Gravesend	17	21	—
Great Grimsby	—	57	3
Guernsey	62	21	5
Halifax	16	14	—
Handsworth	87	58	4
Hanley	49	99	—
Harrogate	14	—	5
Harrow	—	18	—
Hastings	43	46	—
,, Priory Road Art Class	—	11	—
Henley-on-Thames	37	32	4
Hereford	16	35	—
Hertford	16	1	—
Heywood	—	13	—
High Wycombe	27	236	7
Hornsey	15	16	—
Horsham	—	—	2
Hove	—	14	—
Huddersfield	17	5	—
Hull	145	30	—
Hyde	—	32	—

Name of School.	Objects.	Paintings, Drawings, Photographs.	Books.
Ilford	—	12	—
Ilkley	15	—	—
Ipswich	54	41	11
Jersey	—	15	—
Keighley	17	2	—
Kendal	16	—	—
Kidderminster	17	2	—
Kingston-on-Thames	18	22	3
Lancaster	75	35	6
Leamington, Parade	17	—	—
„ Warwick Street	14	—	—
Leeds, Mechanics' Institute	143	68	—
Leek	140	93	3
Leicester, Municipal School	203	263	17
„ Wyggeston Hospital	16	—	—
Lewes	16	13	5
Leyton	90	78	5
Lincoln	17	—	3
Liscard	—	1	—
Liverpool, Mount Street	—	1	—
„ South District	16	2	—
LONDON:			
Aldgate	314	277	—
Battersea	135	140	3
Birkbeck Institute	52	64	4
Blackheath	90	17	7
Bloomsbury	17	1	—
Bolt Court	33	116	—
Brixton	—	5	—
Camberwell	133	234	4
Camden	178	477	8
Chelsea	54	43	8
Clapham	34	276	40
Clapton	15	8	—
Clerkenwell	219	265	4
Hackney	16	1	—
Hammersmith	175	312	5
Highbury	16	—	—
Islington	16	—	—
Lambeth	16	1	—
Mile End	14	—	—
New Cross	—	13	3
Putney	58	80	3
Regent Street Polytechnic	17	1	3
St. Charles' Training College	—	9	—
St. Mark's College	—	2	—
St. Martin's	27	43	—
Shoreditch	6	33	—
South Kensington:—			
Royal College of Art	324	599	9
School of Art Woodcarving	2	—	—
School of Art Needlework	—	23	—
Thornton Heath	—	10	—
Wandsworth	14	117	—
West London	16	—	—
Westminster Technical Institute	63	76	8
„ Wesleyan Training College	—	2	—

Name of School.	Objects.	Paintings, Drawings, Photographs.	Books.
Longton	5	51	9
Loughborough	—	—	6
Lowestoft	17	—	7
Lydney	—	12	—
Macclesfield	17	1	—
Maidenhead	157	96	12
Maidstone	—	49	—
Malvern	28	27	3
Manchester, Cavendish Street	19	—	—
„ Grammar School	38	8	—
„ School of Technology	86	167	—
Mansfield	16	—	—
Margate	15	13	—
Middlesbrough High School	—	7	—
Morecambe	63	53	—
Nelson	—	17	—
Nettleham	14	1	—
Newark	16	—	—
Newbury	11	—	—
Newcastle-under-Lyme	—	13	—
Newcastle-upon-Tyne	68	55	4
Newport (Mon.)	—	54	—
Northampton	15	28	—
Northwich	—	12	—
Norwich	87	140	—
Nottingham	17	14	—
Nuneaton	—	5	—
Oxford	—	1	5
Oldham	28	84	4
Padiham	28	65	—
Paignton	21	33	5
Penzance	17	—	1
Peterborough	20	81	5
Plymouth, Technical School	67	26	3
„ Westwell Street	16	1	—
Poole	15	1	—
Portsmouth	—	2	3
Preston	15	16	3
Reading College	127	95	5
„ School of Art	17	22	8
Redditch	17	—	—
Redhill	115	122	11
Redruth	15	2	5
Richmond	—	2	4
Rochdale	18	2	—
Rochester	111	143	5
Rotherham	47	30	—
St. Albans	19	13	—
Salford	16	14	—
Salisbury	16	80	—
Sandringham	32	72	—
Scarborough	16	14	—
Selby	15	—	2

Name of School.	Objects.	Paintings, Drawings, Photographs.	Books.
Settle	—	15	—
Sheerness	—	39	—
Sheffield	68	50	—
Shrewsbury	—	—	3
Shipley	129	114	—
Sidcup	—	2	—
Sleaford	15	13	—
Southampton	17	33	—
Southend	—	55	—
Southport	16	14	2
South Shields	18	13	—
Stafford	17	13	—
Stockport	15	19	—
Stoke-upon-Trent	17	14	—
Stourbridge	15	—	—
Stratford	15	—	—
Stratford upon-Avon	—	22	—
Stroud	16	14	—
Sunderland	54	14	—
Surbiton	89	12	—
Swansea	—	7	—
Swindon	—	35	10
Taunton	20	—	5
Teignmouth	47	20	7
Tiverton	17	2	8
Torquay	24	25	6
Tottenham	—	1	—
Truro	17	—	—
Tunbridge Wells	98	88	—
Tunstall	16	—	—
Wakefield	—	1	—
Walkden	—	35	—
Walsall	17	1	4
Walthamstow	105	139	—
Warminster	16	—	—
Warrington	53	15	—
Watford	—	14	—
Wednesbury	—	3	—
West Bromwich	175	40	3
West Ham	102	118	5
West Hartlepool	15	—	6
Weston-super-Mare	16	—	—
Weymouth	16	—	—
Wigan	25	16	—
Wimbledon	366	286	13
Wimborne	—	8	—
Winchester	51	46	—
Windsor	—	3	—
Winsford	—	13	—
Wisbech	31	1	—
Wolverhampton	111	104	—
Woolwich	203	175	—
Worcester	38	14	—
Wrexham	—	6	5
Yarmouth	14	12	—
York, Clifford Street	15	13	—
„ Minster Yard	—	1	—

Name of School.	Objects.	Paintings, Drawings, Photographs.	Books.
SCOTCH SCHOOLS, ETC. :—			
Aberdeen	16	14	—
Alloa	—	29	—
Burnside	—	—	6
Dumbarton	17	—	—
Dundee High School	17	—	—
,, Technical School	15	1	—
Dunfermline Public Libraries	16	213	—
,, Technical School	16	9	7
Edinburgh	9	—	—
Falkirk	18	13	—
Forfar	7	30	—
Glasgow, Athenæum	17	—	—
,, Renfrew Street	191	74	—
,, Thomson Street	16	—	—
,, Haldane Academy	19	1	—
,, Weaving College	217	—	—
Greenock	—	—	3
Hawick	16	—	—
Inverness	—	—	5
Leith	—	40	5
Paisley	38	14	—
Perth	17	1	—
IRISH SCHOOLS, ETC. :—			
Belfast	15	58	—
Cork	14	7	—
Drogheda	—	1	—
Dublin : Met. School of Art	243	180	11
,, Dept. Agriculture for Circ. in Ireland	—	230	—
Galway	—	1	3
Kenmare	15	—	—
Limerick	17	19	—
Londonderry	31	—	—
Waterford	17	—	—
	11,026	12,426	629
Grand Total		24,081	

(3.) SUMMARY of MUSEUMS, EXHIBITIONS, SCHOOLS OF ART and ART CLASSES, &c., to which OBJECTS have been LENT during the Year 1906.

Museums - - - -	93	Number of objects, &c., lent	23,539
Exhibitions - - - -	30	„ „ „	3,120
Schools of Art and Art Classes	301	„ „ „	24,081
Lectures, &c. - - - -	7	„ „ „	203
		Lantern Slides - - -	2,185
Total - - -	431		53,128

RETURN of PROVINCIAL MUSEUMS to which AID was granted for the purchase of WORKS of ART and SCIENTIFIC OBJECTS.

Name of Museum.	No. of Objects.	Description of Objects.	Aid by the Board.	Total Cost.
			£ s. d.	£ s. d.
Bolton	85	Botanical and Biological specimens	23 9 11	26 19 11
Bootle	13	Reproductions of Roman bronzes	25 2 9	50 5 7
Brighton	17	Natural History specimens	35 0 0	106 0 0
Bristol	115	Assyrian sculptured slabs, Bristol China and Glass, and Natural History specimens.	301 1 1	607 2 2
Cardiff	31	Old English pottery; reproductions of Mycenaean metalwork.	66 0 3	132 8 6
Cheltenham	14	Reproductions of English Silversmiths' work	43 6 3	86 12 6
Darwen	73	Fictile Ivories	9 4 9	18 19 7
Dundee	10	Scientific objects and reproductions of sculpture	13 14 6	27 9 0
Glasgow	1	Water colour painting of a tapestry	32 10 0	65 0 0
Halifax	600	Ethnographical collections	75 0 0	350 0 0
Hanley	72	Old English Pottery	41 11 7	83 3 3
Hastings	16	Natural History specimens	2 0 0	4 0 0
Hull	—	Roman and other ornaments	9 19 6	19 19 0
Ipswich	13	Natural History specimens	151 5 0	302 10 0
London (South)	46	Fictile Ivories	4 16 9	9 13 7
Manchester, Owens College	—	Natural History specimens	28 16 0	57 12 0
" School of Art Museum	18	Pottery, Enamels, Embroideries and Metalwork	28 1 7	56 3 3
Perth	—	Natural History and Botanical specimens	24 8 3	48 16 6
Plymouth	7	Autotypes and Biological specimens	4 18 6	9 17 0
Preston	27	Decorative Sculpture and Paintings	240 10 2	481 0 4
Sheffield	42	Metalwork and Pottery	39 0 6	78 1 0
Stockport	21	Botanical models and Electrotypes of silversmiths' work.	24 18 0	49 16 0
Stoke-upon-Trent	25	Old English Pottery	26 19 9	53 19 6
Warrington	41	Old English Pottery, Glass, &c.	15 11 3	31 2 6
Worcester	11	Biological specimens	5 7 9	10 15 6
Great Yarmouth	77	Natural History specimens; Yarmouth Pottery and Glass.	95 17 0	191 14 0
	—	TOTAL £	1,368 11 1	2,959 0 8

RETURNS OF ATTENDANCES AND RECEIPTS.

(*a*) *Victoria and Albert Museum.*

(1.) Return of Monthly Attendance of Visitors.

1906.	Free Days.		Students' Days.	Sundays.	Totals.	Corresponding Totals in			
	Morning.	Evening.				1905.	1904.	1903.	1902.
January -	40,666	7,477	19,863	3,807	71,813	68,039	70,733	60,510	62,757
February -	27,627	6,732	13,213	6,414	53,986	53,541	57,675	54,703	48,876
March - -	32,428	8,306	16,676	8,519	65,929	68,037	65,205	65,208	81,921
April - -	61,009	9,641	11,454	10,222	92,326	110,901	104,288	98,408	78,135
May - -	27,594	8,599	17,594	8,055	61,842	64,135	85,211	60,937	86,538
June - -	41,161	9,156	12,535	7,287	70,139	82,511	58,623	72,187	71,106
July - -	33,986	8,061	19,417	9,609	71,073	70,410	72,332	74,752	68,513
August - -	47,049	10,853	35,965	9,242	103,109	111,636	99,770	109,549	98,168
September -	31,617	8,816	17,923	9,661	68,017	73,083	67,131	73,336	71,675
October - -	40,669	8,429	16,732	7,097	72,927	64,440	59,950	63,773	58,249
November -	28,837	7,574	14,464	4,045	54,920	51,914	48,009	58,373	57,804
December -	37,855	7,377	8,184	4,249	57,665	59,553	60,042	65,207	72,189
Totals -	450,498	101,021	204,020	88,207	843,746	878,200	848,969	856,943	855,931

(2.) Comparative Statement of Yearly Attendance of Visitors to the Museum from 1902 to 1906.

Year.	Total for the Year.	Average Monthly Attendance.		Total Monthly Average.
		Free Days, Morning & Evening.	Students Days.	
1902 - - - -	855,931	52,778	18,549	71,327
1903 - - - -	856,943	55,759	15,653	71,412
1904 - - - -	848,969	54,959	15,788	70,747
1905 - - - -	878,200	52,919	20,264	73,183
1906 - - - -	843,746	53,310	17,002	70,312

Total since the opening of the Museum on 22nd June, 1857, 43,955,536.

(3.) Attendance of the Public during Holidays in the past Five Years.

Year.	Easter.		Whitsuntide.		First Monday in August.	Christmas.	
	Easter Monday.	Easter Week.	Whit Monday.	Whitsun Week.		Boxing Day.	Christmas Week.
1902 -	17,201	43,914	18,654	38,528	11,336	7,014	22,808
1903 -	15,724	48,730	6,704	23,448	11,080	6,808	29,529
1904 -	16,855	48,701	9,875	34,821	7,615	4,864	28,090
1905 -	16,285	51,137	17,119	37,560	10,099	6,895	23,796
1906 -	9,996	39,264	9,562	24,831	7,844	3,596	15,755

(4.) Return of Receipts.

——	1902.			1903.			1904.			1905.			1906.		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d*	£	*s.*	*d.*
Admission fees -	417	13	0	462	16	0	461	8	6	447	6	0	461	2	0
Periodical tickets	77	5	0	77	3	6	78	1	0	82	17	0	73	5	6
Waiting rooms -	29	4	7	31	16	11	30	11	1	24	18	6	23	18	10
Totals - -	524	2	7	571	16	5	570	0	7	555	1	6	558	6	4

(*b*) *Bethnal Green Branch Museum.*

(1.) Return of Monthly Attendance of Visitors.

1906.	Week-days.		Sundays.	Totals.	Corresponding Numbers in			
	Morning.	Evening.			1905.	1904.	1903.	1902.
January -	31,002	12,188	2,006	45,196	39,707	47,444	36,936	35,647
February -	16,046	11,317	4,531	31,894	30,286	37,125	31,714	29,678
March -	19,621	13,470	7,698	40,789	36,334	41,878	39,436	43,704
April -	25,495	10,863	10,350	46,708	50,126	47,521	45,119	40,890
May -	15,849	9,189	7,104	32,142	31,475	41,140	31,613	37,483
June -	16,717	7,586	7,557	31,860	33,012	27,486	30,677	31,773
July -	15,019	5,838	8,442	29,299	29,358	34,025	29,715	25,903
August -	29,486	7,509	7,424	44,419	45,775	43,282	42,851	41,838
September	15,712	9,747	10,793	36,252	30,435	29,982	25,088	25,767
October -	21,147	9,646	5,686	36,479	32,021	28,527	27,955	26,619
November -	14,467	10,086	1,448	26,001	27,027	22,570	22,139	25,175
December -	23,072	8,293	1,445	32,810	36,203	41,157	15,179	43,522
Totals -	243,633	115,732	74,484	433,849	421,759	442,137	378,422	407,999

Total since the opening of the Museum on the 25th June, 1872, 17,720,100.

(2.) ATTENDANCE OF THE PUBLIC DURING HOLIDAYS IN THE PAST FIVE YEARS.

YEAR.	Easter.		Whitsuntide.		First Monday in August.	Christmas.	
	Easter Monday.	Easter Week.	Whit Monday.	Whitsun Week.		Boxing Day.	Christmas Week.
1902 -	5,687	17,671	6,396	13,625	3,803	3,383	21,975
1903 -	5,978	20,605	4,454	12,788	3,969	3,078	17,156
1904 -	5,934	22,281	5,059	14,882	3,843	2,937	19,866
1905 -	6,346	21,756	5,415	13,168	4,087	3,138	13,660
1906 -	4,899	17,780	4,522	11,402	3,176	1,995	8,905

(3.) RETURN OF RECEIPTS.

Year	1902.	1903.	1904.	1905.	1906.
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
Waiting rooms -	3 18 4	3 12 5	3 13 2	3 5 11	3 19 1

THE ROYAL COLLEGE OF SCIENCE, LONDON, WITH WHICH IS INCORPORATED THE ROYAL SCHOOL OF MINES.

THE ROYAL COLLEGE OF SCIENCE, LONDON, WITH WHICH IS INCORPORATED THE ROYAL SCHOOL OF MINES.

Report for the Session 1905–6.

The students having assembled, as usual, on Wednesday morning, the session was formally opened on Thursday, October 5th, by the distribution of prizes and certificates won in the previous session. These were presented to the successful students by Professor J. W. Judd, C.B., F.R.S., who had recently retired from the offices of Professor of Geology and Dean of the School at the end of the session.

The chair of zoology being still vacant, an arrangement had been made with Professor Dendy, of King's College, who undertook the charge of the classes for the session.

At the commencement of the session the chair of geology was for a time vacant in consequence of the retirement of Professor Judd, but in January, 1906, the vacancy was filled by the appointment of Mr. W. W. Watts, M.A., M.Sc., F.R.S.

The vacancy in the chair of mining, caused by the lamented death of Sir Clement Le Neve Foster, had been filled by the appointment of Mr. Herbert S. Cox, Assoc. R.S.M.

Professor Tilden had been appointed Dean in succession to Professor Judd.

A special course of instruction to teachers was given by Professor H. Adams on the "Mechanics of Building Construction during the month of July

The following tabular statement gives the number of students under instruction during the Session 1905–6, *i.e.*, from 4th October, 1905, to 30th June, 1906.

Subjects.		Associateship Students.						Occasional Students.			Grand Total.	Individual Students.
		National Scholars.	Royal Exhibitioners.	Local Exhibitioners.	Free Students.	Fee-paying Students.	Total.	Students in Training for Teachers.	Fee-paying Students.	Total.		
Mechanics	1st term	19	9	4	2	31	65	13	1	14	79	79
	2nd term	5	4	1	—	—	10	5	—	5	15	
Mathematics		37	15	10	12*	28	102	17	—	17	119	119
Physics	1st term	7	1	—	—	—	8	7	—	7	15	90
	2nd term	26	7	7	5	28	73	16	1	17	90	
Chemistry	1st term	29	8	10	21*	41	109	11	4	15	124	129
	2nd term	12	—	3	18*	6	39	3	1	4	43	
Biology	1st term	7	—	—	1	2	10	8	3	11	21	22
	2nd term	2	—	—	—	—	2	6	2	8	10	
Geology	1st term	1	—	—	—	1	2	3	—	3	5	75
	2nd term	19	7	3	2	33	64	8	2	10	74	
Metallurgy	1st term	1	1	1	2	36	41	2	6	8	49	52
	2nd term	1	—	—	2	8	11	2	4	6	17	
Mining		—	1	1	—	37	39	4	4	8	47	47

* Includes Inland Revenue and Customs students.

Total number of individual students - - - 317

Of which—Government students - - - - 185
Fee-paying students - - - - 132

The amount received for fees during the Session was £2,939 10s.

Number of Science teachers who received instruction during July, 1906.

	Number who attended.
Mechanics	28
Mining	12
Physiographic Geology	34
The Mechanics of Building Construction	25
Total	99

MECHANICS AND MATHEMATICS—PROFESSOR J. PERRY, D.Sc., LL.D., F.R.S.

Mechanics, Part I.—The courses of lectures, numerical and other exercise work, laboratory work, and machine drawing, extended from October, 1905, to February, 1906, and were attended by 63 students.

All of these entered for the final examinations, of whom 37 passed in the first class and 23 in the second class.

Mechanics, Part II and III.—This course extended from October, 1905, to June, 1906, and consisted of lectures, numerical and other exercise work, laboratory work, and machine drawing. Eleven students attended the course, and at the final examinations 4 passed in the first class and 7 in the second class.

Graphics and Practical Geometry.—This course consisted of general graphical work in the first term, and practical solid geometry in the second term. It was attended by 64 students, all of whom entered for the final examination; 44 passed in the first class and 15 in the second class.

The prize for the best student in mechanics was awarded to Mr. F. G. Turner.

At the end of the session 10 students obtained the Associateship in Mechanics, 4 in the first class and 6 in the second class.

Summer Course.—During July, 1906, a course in Theoretical Mechanics was attended by 28 Science Teachers. Lectures were given on the general principles of dynamics, with applications to problems on the mechanics of solids and fluids. These were illustrated by examples worked out in class, by experimental work in the laboratory, and by graphical work in the drawing office.

Mathematics.—The classes were attended in all by 119 individual students, and at the examinations 86 qualified in Class A, 44 in Class B, 32 in Class C, 17 in Class D, and 5 in Class E.

The prize for the best student in Mathematics was awarded to Mr. J. S. G. Thomas.

PHYSICS—PROFESSOR H. L. CALLENDAR, M.A., LL.D., F.R.S.

Physics, Part I.—This course was attended by 75 students, of whom 73 presented themselves for examination. Of these 20 were placed in the first class, and 43 in the second class. Seven failed in theory only, one in the practical examination only, and two in both. Thirteen students who had failed on previous occasions were re-examined, of whom 7 failed either in theory or in the practical examination.

Part II.—This course was attended by 8 students, all of whom entered for the final examination. Of these, 2 were placed in the first class, and 6 in the second.

Astronomical Physics.—This class was attended by all the students taking Physics, Part I. The evening demonstrations were well attended throughout the term, and the students showed a satisfactory knowledge of the subject in the examination.

New Buildings.—During the month of July, 1906, the staff were occupied in superintending the removal of the apparatus to the New Buildings. Good progress was made in the equipment of the workshop, and the installation of electrical and other appliances for experimental work. Preparations for removal, and the necessity of continual supervision of the fittings, etc., of the New Buildings, left little or no time for research.

Research.—Prof. Callendar and Assistant Prof. Fowler undertook an expedition to Spain to observe the total solar eclipse of Aug. 30, 1905. The instruments specially constructed and taken out for the

purpose included a coronal thermopile fitted to a short-focus 20-inch reflector for the study of coronal radiation, a combined coronograph and prismatic camera of 40-feet focal length, an equatorial for visual observations, and a slit spectrograph of high dispersion. This work occupied nearly the whole of the long vacation, but the main objects of the expedition were unfortunately frustrated by cloud. A report of the results obtained, with a description of the special instruments designed, was submitted to the Royal Society and published in the Proceedings.

Professor Callendar has continued his researches on the measurement of radiation, and has devised some new methods and instruments which have been constructed in the laboratory. Mr. S. W. J. Smith has continued his researches on the Thermomagnetic Analysis of Nickel Iron Alloys, the results of which have been communicated to the Royal Society. Preparations are in progress for other researches, which will be put in hand as soon as the equipment of the new laboratories is sufficiently advanced.

Papers.—The following scientific papers have been published :—

Total Solar Eclipse of Aug. 30, 1905 :—Report of the Expedition to Castellon de la Plana, Spain. By H. L. Callendar, and A. Fowler, Proc. R. S. Vol. LXXVII., p. 1.

High-level Chromospheric Lines, and their behaviour in Sun-Spot Spectra. By A. Fowler. Monthly Notices R.A.S. Vol. LXVI., p. 361.

Observations on the Spectra of Sun-Spots, Region B to E (including a general discussion of phenomena). A. Fowler, Transactions of the International Solar Union, Vol. I., p. 201.

Chemistry—Professor W. A. Tilden, D.Sc., F.R.S.

The instruction in this division consisted of :—

(1.) A course of about 70 lectures on inorganic chemistry, and the principles of chemical philosophy, extending from the beginning of October to the middle of February, delivered to students in their first year by Professor Tilden.

(2.) A course of 30 lectures on physical and theoretical chemistry, extending from the end of October to the end of January, delivered to students in their second or third year by Dr. J. C. Philip.

(3.) A course of 12 lectures on the theory of analysis, extending from the end of October to the end of January, delivered to students in their first year by Dr. G. T. Morgan.

(4.) A course of 30 lectures on elementary organic chemistry, extending from the middle of February to the beginning of June, delivered to students in their first or second year by the Assistant Professor, Dr. M. O. Forster.

(5.) A course of 60 lectures on organic chemistry, extending from the middle of February to the beginning of June, delivered to students in their second or third year by Dr. M. O. Forster.

In addition to the foregoing courses, frequent lectures and demonstrations on the principles underlying qualitative and quantitative analysis were given in the laboratories, and classes for instruction in chemical arithmetic were also held.

The number of students receiving instruction in Chemistry during the session was 124 in the first term and 43 in the second term. The numbers in the different categories of students are shown on page 58.

The conduct and diligence of the students in all the classes have been satisfactory.

Research Laboratory.—Mr. F. P. Leach, B.Sc., A.R.C.S. completed an investigation of the limonene nitrosocyanides and their derivatives. Miss H. M. Judd, B.Sc., A.R.C.S., was occupied with the preparation and characterisation of various pinylamine derivatives. Mr. F. G. Shepheard, B.Sc., A.R.C.S., applied the Grignard reaction to the nitrosochlorides of dextro-limonene, and Mr. D. F. Blyther, A.R.C.S., investigated the aminodi-carboxylic acid derived from pinene. Dr. Hans Grossman, of Zürich University, spent three months in the laboratory, and completed a study of the nitrogen halides from camphorylpseudocarbamide, whilst Dr. H. E. Fierz worked during four weeks upon certain derivatives of camphor. The following papers, containing the results of experimental work performed in the chemical laboratories, were published during the session :—

The Arylsulphonyl-paradiazoimides. By G. T. Morgan and F. M. G. Micklethwait. Trans. Chem. Soc., 1905, 1302.

Researches on the Freezing Points of Binary mixtures of Organic Substances ; the Behaviour of the Dihydric Phenols towards Paratoluidine, α-Naphthylamine, and Picric Acid. By J. C. Philip and S. H. Smith. Trans. Chem. Soc., 1905, 1735.

The Diazo-derivatives of 1 : 5—and 1 : 8-Benzene-sulphonyl-naphthylenediamines. By G. T. Morgan and F. M. G Micklethwait. Trans. Chem. Soc., 1906, 4.

Studies in the Camphane Series. Part XXI. Benzenediazo-pseudosemicarbazinocamphor and its Derivatives. By M. O. Forster. Trans. Chem. Soc., 1906, 222.

Studies in the Camphane Series. Part XXII. Nitrogen Halides from Camphoryl-pseudocarbamide. By M. O. Forster and H. Grossmann. Trans. Chem. Soc., 1906, 402.

The Residual Affinity of Coumarin as shown by the Formation of Oxonium Salts. By G. T. Morgan and F. M. G. Micklethwait. Trans. Chem. Soc., 1906, 863.

The Action of Magnesium Methyl Iodide on Dextro-limonene Nitrosochlorides. By W. A. Tilden and F. G. Shepheard. Trans. Chem. Soc., 1906, 920.

Influence of Substitution on the Formation of Diazoamines and Aminoazo-compounds. Part V. *s*-Dimethyl-4 : 6-diamino-metaxylene. By G. T. Morgan and A. Clayton. Trans. Chem. Soc., 1906, 1054.

The Diazo-derivatives of the Mixed Aliphatic Aromatic Benzene-sulphonyl-aminobenzylamines. By G. T. Morgan and F. M. G. Micklethwait. Trans. Chem. Soc., 1906, 1158.

The Action of Nitrous Acid on the Arylsulphonyl-metadiamines. By G. T. Morgan and F. M. G. Micklethwait. Trans. Chem. Soc., 1906, 1289.

A Contribution to the Study of Stable Diazo-compounds. Preliminary Note. By G. T. Morgan and W. O. Wootton. Proc. Chem. Soc., 1906, 23.

Some New Derivatives of Pinene. By F. P. Leach. Proc. Chem. Soc., 1906, 137.

1 : 3-Diphenylbarbituric Acid and some Coloured Derivatives. Synthesis of 1 : 3-Diphenyluric Acid. By M. A. Whiteley. Proc. Chem. Soc., 1906, 200.

The Aminodicarboxylic acid derived from Pinene. By W. A. Tilden and D. F Blyther. Proc. Chem. Soc., 1906, 255.

The Preparation and Properties of Dihydropinylamine (Pinocamphylamine). By W. A. Tilden and F. G. Shepheard. Proc. Chem. Soc., 1906, 255.

Ueber Azimidoverbindungen aus Aromatischen Paradiaminen. By G. T. Morgan and F. M. G. Micklethwait. Ber. d. Deutsch. Chem. Ges., 1906, 2869.

Analytical Laboratories.—The North and East Laboratories were under the charge of Mr. H. Chapman Jones, who was assisted by Dr. J. C. Philip, Mr. A. Shepherd (student in training), and Mr. J. M. Hird (teaching scholar).

During the winter term 57 students worked in these laboratories, forty taking the courses for Part I, thirteen of whom proceeded to more advanced prescribed work. Twelve students continued the ordinary work for Parts II and III, three were engaged in special work, and one in research, while one attended in the afternoon for a short time only.

During the summer term these laboratories were attended by 29 students, twenty-four of whom continued the ordinary course for Parts II and III, seven being present in the afternoon only; three did special analytical work, and two were engaged in research.

The South Chemical Laboratory was under the charge of Dr. G. T. Morgan, who was assisted by Dr. M. A. Whiteley, Mr. A. Clayton, B.Sc. (student in training), and Mr. W. O. Wootton, B.Sc. (teaching scholar).

During the first term the laboratory was attended by 57 students, of whom forty-five passed through the course of instruction prescribed for Part I, whilst twelve were engaged in the quantitative work and physical exercises required for Part II.

During the second term there were 27 students in the laboratory. Twelve were engaged in the Part III course and four were occupied with the quantitative work and simple organic preparations required for Part II, whilst eight attended the laboratory in the afternoon only, and performed the volumetric exercises of Part II, with simple organic preparations. Of the remaining three students, one took a special course of organic qualitative analysis, one was employed in research on the analysis of alloys and minerals, and one was occupied with organic research.

In the summer term, a course of twelve lessons in photographic methods was given by Mr. H. Chapman Jones.

In consequence of the disturbance occasioned by the preparations for removal of the Chemical Division into the new buildings, no Summer course in chemistry was held.

Zoology.

In the absence of an appointed Professor of Zoology, the supervision of the department was, for administrative purposes, assigned to the Professor of Botany.

Owing to the appointment of Messrs. J. E. S. Moore and C. E. Walker to the University of Liverpool it became necessary to make new arrangements for carrying on the zoological teaching in the college.

Professor Dendy, of King's College, was appointed for the session to take charge of the classes, and Mr. A. D. Darbishire was similarly appointed as Demonstrator. Mr. J. Southwell acted as teaching assistant, but early in the session left the college and is now Assistant-director of the Ceylon Pearl Fisheries.

The elementary class was attended by 10, the advanced class by 2 students.

Miss Ash was engaged in Zoological Research, but left during the session on obtaining a research fellowship at Bedford College.

Botany—Professor J. B. Farmer, D.Sc., F.R.S.

The elementary class was attended by 12 students, 11 of whom sat for the terminal examination, 3 being placed in the first class.

Eight students attended the advanced class, 4 sat for the sessional examination and 2 were placed in the first class.

Mr. M. Wilson obtained first class honours in Botany at the University of London.

Dr. E. Drabble resigned the post of Demonstrator on being appointed scientific assistant in the Liverpool Institute of Scientific Research in the Tropics. He was succeeded by W. W. McRae, M.A., B.Sc. (Ed.).

Mr. A. S. Horne, Marshall Scholar, has been engaged in research on Davidia, a Chinese genus of plants, and his results are nearly ready for publication.

Miss W. Smith, 1851 exhibitioner, was engaged on an investigation on the Rubber-yielding plants.

Miss Gibbs continued her work on the structure and morphology of the caryophyllaceae. Some results have already been published, and a final memoir on the subject is in preparation. The following papers were published during the session:—

J. B. Farmer, J. E. S. Moore and C. E. Walker. "On the resemblance existing between the so-called 'Plimmer Bodies' of malignant growths, and certain normal constituents of the reproductive cells of animals." Proc. Roy. Soc., Vol. LXVII.

J. B. Farmer, J. E. S. Moore and C. E. Walker. "On the behaviour of Leucocytes in malignant growths." Trans. Path. Soc. Lond., Vol. LVI.

J. B. Farmer, J. E. S. Moore and C. E. Walker. "On the cytology of malignant growths." Proc. Roy. Soc., Vol. LXXVII.

S. Chandler. "On the arrangements of the vascular strands in the 'seedlings' of certain Leptosporangiate ferns." Annals of Botany, Vol. XIX.

E. Drabble and H. Lake. "On the effect of carbon dioxide on the geotropic curvature of the roots of *Pisum sativum*." Proc, Roy. Soc., Vol. LXXVI.

The teaching collections have been enriched by a fine set of photo-micrographs illustrating the structure of timbers. An interesting set of South African plants was presented by Miss L. Gibbs.

GEOLOGY—PROFESSOR W. W. WATTS, M.A., M.SC., F.R.S.

The classes in Parts II and III were attended during the whole session by 4 students, 2 of whom were "students in training assisting in teaching." The lectures on rock-forming minerals were given by the Assistant-Professor, Dr. C. G. Cullis, and most of those on Petrology by the Senior Demonstrator, Mr. R. F. Gwinnell, before the appointment of the Professor. A series of lecture-demonstrations on Palæontology was afterwards arranged for, and carried out by Mr. A. Morley Davies.

One student presented himself for examination on the whole course, and two in Part II only; 1 was placed in the first class and 2 in the second. A certain amount of field-work was accomplished in the form of a number of day excursions into Surrey under the charge of the Assistant-Professor. Two other students worked in the laboratory for a short time in preparation for the London Degree examinations, and another began a research on the Bunter Pebbles of the West of England.

Of the Elementary students 28 took the course arranged for the Royal School of Mines students. Twelve of these passed in the first class, 13 in the second, and 3 failed. Of these last 1 passed in practical work only. Six students of former years were re-examined, of whom 4 passed and 2 failed. One other student who had been exempted from the theoretical examination passed in the first class of the practical examination.

The students taking the course arranged for the Royal College of Science students numbered 42; in the examination 10 of these passed in the first class, 29 in the second, and 3 failed.

The Murchison medal and prize of books was divided between C. C. Gow, a student of the Royal School of Mines, and D. Orson Wood, of the Royal College of Science.

A summer course was held from July 4th to the 26th, and was attended by a very satisfactory class of 34 students. The subject was Physiographic Geology. About 15 lectures on the constituents, the making, and the characters of rocks, were given by the Professor, and this was followed up by laboratory work on the same lines. One field excursion was also organised and carried out.

The staff of the division during the year consisted of the following—Dr. C. G. Cullis, the Assistant-Professor; Mr. R. F. Gwinnell, the Senior Demonstrator; Mr. H. Cecil Jones, Assistant-Demonstrator; with Mr. A. Morley Davies, appointed as a special demonstrator in the place of two student assistants. T. Dewhurst and A. R. Walker continued to act as students in training assisting in teaching. During the long vacation Mr. H. C. Jones was appointed as an Assistant-Superintendent in the Geological Survey of India.

The lectures and laboratory work of the year followed as nearly as possible along the lines laid down by Professor Judd during his tenure of the Geological Chair. This course has been most carefully thought out, and it has been elaborated, improved, and systematised in its details year by year until it has become a most thorough and comprehensive scheme. Although based, as all satisfactory teaching must be, on a knowledge of the principles of the Science, it aims at giving the students a practical and technical knowledge of their subject, so that they can face the practical problems which will meet them in their after experience. What are thought to be slight improvements have been suggested and carried out in one or two points, such as additional work in structural and economic geology; but it is very difficult, in existing circumstances, to give as much weight as is desirable to those parts of the science which have a direct economic bearing.

Metallurgy—Professor W. Gowland, Pres. Elect. Inst. M.M., A.R.S.M., F.S.A., F.I.C.

The number of students who attended the courses of instruction during the first term was 49 and during the second term 17.

Professor Gowland delivered during the first term 40 lectures, in addition to three dealing with Furnace Design and Building and a special demonstration, at which the students were required to set out with bricks to full working scale, the foundations and various portions of the brickwork of a copper smelting furnace. The work of the laboratory was supplemented by 26 lectures by the Instructor-in-Assaying, dealing with the sampling of Ores, examination of Refractory Materials and the theory of Assaying. At the sessional examination held in February, 38 students presented themselves for the examination in Metallurgy, of whom 29 obtained a first class and 9 a second class. In the examination in Practical Assaying there were 37 candidates, of whom 23 obtained a first class, 12 a second class and 2 failed to satisfy the examiners. To the 26 students attending the Part II. Course, Professor Gowland gave 50 lectures, together with a special series of demonstrations in Furnace Drawing and Construction. Complete and detailed working drawings of a furnace, specially designed by the Professor, were made by the students.

During this term 30 lectures on Electro-Metallurgy, Pyrometry, Photomicrography and Assaying were given by Mr. W. H. Merrett. Two students were engaged in special investigations in the metallurgical laboratories during the session. The exact nature of the original work undertaken by them is given below.

Special courses in Assaying as applied to Prospecting and also in Bullion Assaying were given respectively to Captain Evans of the Army Service Corps and Mr. Unwin A. Spence of the Bombay Mint. Mr. Spence eventually qualified for the position of Assayer at an Indian mint.

At the final examination in June, 14 candidates were examined in Metallurgy and Assaying, 6 of whom obtained the Associateship in the first class and 5 in the second class.

The Bessemer Medal and prize of books were awarded to Mr. H. B. Corbin.

The Institution of Mining and Metallurgy Scholarship of £50 for this year was obtained by Mr. Charles Ingle Robinson.

A Scholarship was also awarded to Mr. B. G. C. Gard'ner, A.R.S.M., to assist him in taking a post-graduate course on the Rand.

Research :—

A considerable amount of research work was conducted in this division during the year.

Messrs. E. A. Wraight, A.R.S.M., and E. G. Ll. Roberts during the past year completed their research on the possibility of decarburising ferromanganese. This subject has been the object of the most careful and thorough investigation by them, and the completed work involved about 200 complete analyses of the alloy, together with over 250 experiments, many of the latter involving from 12 to 24 hours' direct supervision. The research was conducted mainly in the Metallurgical Laboratory of the Royal School of Mines, while the more practical side of the investigation, under works conditions, was carried out in South Wales at the works of the Llanelly Steel Company through the courtesy of Mr. H. Eccles, High Sheriff of Glamorganshire, who placed his furnaces at their disposal and gave them every possible facility for conducting their experimental work. The report submitted occupied 57 pages in the Iron and Steel Institute Journal.

The Matthey Prize for Original Research was obtained by Mr. A. E. Pratt for his investigations in connection with the alloys of copper and calcium. This research was undertaken at the suggestion of the Professor and has been conducted under his supervision. Some of the alloys obtained exhibit extraordinary properties and the investigation has proved to be one of extreme interest.

Practical Work.—The following practical work was performed during the session, in addition to the Elementary and Advanced Courses of Assaying :—

1. Furnace building.
2. Stamp milling of gold ores.
3. Extraction of gold from an ore by the cyanide process.
4. Testing the suitability of ores for the cyanide process.
5. Extraction of gold from concentrates by roasting and chlorination.
6. Chloridising roasting of silver ore.
7. Pan-amalgamation of silver ore.

8. Electrolytic deposition of copper, both by revolving and fixed cathode methods.
9. Smelting lead and copper ores in makeshift furnaces, as used for prospecting purposes.
10. Smelting copper ores in the blast furnace for matte and running the matte for copper.
11. The extraction of silver from lead by the Parkes' process.
12. Photomicrography of metals, especially steel, after different forms of thermal treatment.
13. Measurement of temperatures by means of a research form of thermo-couple recording pyrometer.
14. Hardening and tempering of steel.
15. Preparation and casting of alloys for testing purposes.

The usual Annual Metallurgical Tour of the class to works in different parts of England and Wales extended from the 19th April until 17th May, when, under the direction of the Professor, the following works were visited :—

1. Guest, Keen and Nettlefields, Ltd., Dowlais Works, Cardiff.
2. The Upper Forest and Worcester Steel and Tinplate Works, Ltd.
3. The Morfa and Middle Bank Copper Works, Swansea.
4. The English Crown Spelter Works, Swansea.
5. The Cape Copper Works, Britonferry.
6. Bath's Ore Yards, Swansea.
7. The Rio Tinto Works, Cwmavon, Port Talbot.
8. The Llanelly Steel Works, Llanelly.
9. The Tinplate and Metal Stamping Works, Llanelly.
10. Green's Foundry Co., Aberystwyth.
11. The St. David's Gold Mines, Ltd., Bontddu, near Dolgelly.
12. The Darwen and Mostyn Ferromanganese Works, Mostyn.
13. Walker, Parker & Co., Ltd., Lead Works, Bagillt.
14. The Brymbo Steel and Ingot Iron Works, Brymbo, near Wrexham.
15. Willans and Robinson's Ferry Works, Queensferry, Flintshire.
16. Barrow Hæmatite Steel Works, Barrow-in-Furness.
17. Millom and Askam Hæmatite Iron Works, Millom, Cumberland.
18. The Carnforth Hæmatite Iron Works, Carnforth.
19. The Farnley Iron Works, near Leeds, Yorkshire.
20. Bell Brothers, Ltd., Middlesbrough.
21. Bolckow, Vaughan & Co.'s Works, Middlesbrough.
22. The Cargo Fleet Iron Works, Middlesbrough.
23. The North-Eastern Steel Works, Middlesbrough.
24. John Brown & Co's Atlas Steel and Iron Works, Sheffield.
25. Firth's Norfolk Works, Sheffield.
26. William Cooke & Co., Ltd., Tinsley Steel, Iron and Wire Rope Works, Sheffield.
27. Huntsman's Crucible Steel Works, Sheffield.
28. The Park Gate Iron and Steel Works, Rotherham.
29. Cyclops Steel and Iron Works, Sheffield.

The Professor again wishes to record particularly his appreciation of the kindness and courtesy extended to his class by the owners and managers of works throughout the tour, and for the special facilities which they afforded the students in examining the plant and processes in every case.

The teaching of the division was as usual conducted with the assistance of teaching scholars, Messrs. E. G. Ll. Roberts and F. G. Sherwood, who were appointed in October and remained with the division until the end of June.

Papers read :—

Messrs. E. A. Wraight, A.R.S.M., and E. G. Ll. Roberts, Carnegie Scholars of the Iron and Steel Institute for 1904 and 1905, read a paper dealing with their researches in the Preparation of Carbon-Free Ferromanganese before that Institute at the May meeting. The paper was published in the Institute Journal, and a further grant of £50 was made to the authors to aid them in further investigations.

Messrs. F. Wintle, A.R.S.M., and R. C. Alabaster, A.R.S.M., read a paper on "Modern Pyritic Smelting" before the Institution of Mining and Metallurgy.

The chief appointments gained by students of the Metallurgical Division during the session 1905–6 were as follows :—

Mr. H. B. Corbin, A.R.S.M., Director of a prospecting expedition at Pedang, Western Sumatra, Dutch East Indies.
Mr. F. G. Sherwood, A.R.S.M., Assistant to Messrs. Sulman & Pickard, London.
Mr. E. G. Ll. Roberts, Assistant to the Superintendent of the Duquesne Steel Works, Pa., U.S.A.
Mr. F. Wintle, A.R.S.M., Metallurgist at the Atmolinsk Copper Mines, Siberia.
Mr. C. T. Nesbitt, A.R.S.M., Chief Chemist to the Brymbo Steel Works, near Wrexham.
Mr. L. E. B. Pearse, A.R.S.M., in charge of a lead rolling works, Calcutta.
Mr. R. F. G. Bayley, A.R.S.M., Cyanide Superintendent of the Redjang Lebong Mine, Sumatra.
Mr. D. M. Levy, A.R.S.M., Assistant Lecturer in Metallurgy at Birmingham University.
Mr. R. C. Alabaster, A.R.S.M., Manager of the Etruscan Copper Company, Italy.
Mr. R. W. G. Corfield, A.R.S.M., Assistant Manager at Dilwyn's Spelter Works, near Swansea.
Mr. A. C. Vivian, A.R.S.M., Assistant to the Borneo Company, Borneo.
Mr. W. F. Collins, A.R.S.M., Manager of the Yunnan Tin Smelting Company, Yunnan, China.
Mr. P. St. J. Dixon, A.R.S.M., Chief Assistant on a gold property in Nigeria.
Mr. E. O. Marks, Assayer at the Mount Morgan Mine, Australia.
Mr. E. J. Starey, Assistant to the Queensland (I.R.) Refractory Ore Company.
Mr. K. Low, A.R.S.M., Assayer and Surveyor to the Clitters' Mines, Cornwall.
Mr. R. C. Philp, Manager to the Mount Cannindah Mine, Queensland.
Mr. Colin Todd, Assistant Cyanide Manager, Altasi Mines, West Africa.
Mr. E. H. A. Joseph, Assistant to Mr. Holloway.

Owing to the removal of the divisions of Chemistry and Physics to the new buildings, it has been possible to obtain additional space for the Metallurgical Classes. The following changes have been made:—The Chemical Lecture Theatre has been altered to suit the requirements of Metallurgy, while the Metallurgical Lecture Theatre has been converted into a Laboratory for advanced work and wet assays. The Chemical Preparation Room has been converted into a Laboratory also for advanced work, while the Advanced Physics Laboratory is now being fitted to contain a collection of Metallurgical specimens illustrating the Professor's lectures.

Mining—Professor S. Herbert Cox, A.R.S.M., M.I.M.M.

At the commencement of the session Mr. S. Herbert Cox was appointed Professor of Mining in succession to the late Sir Clement Le Neve Foster.

The instruction in this division consisted of lecture courses and practical instruction.

Lecture Courses:—Professor Cox delivered 70 lectures in all, viz.:—

(*a*) A course of 10 lectures on Mineral Dressing to the combined Mining and Metallurgical Class of 43 students.

(*b*) A course of 60 lectures on General Mining to the Mining Class of 38 students.

Mr. Cooke delivered 54 lectures on Mine-Surveying to a class of 44 students.

Dr. Percy Potter gave a course of 5 lectures and demonstrations on "First Aid to the Injured."

Practical Instruction:—

Preliminary instruction in field-work was given as usual by way of various surveying and levelling exercises in Hyde Park, the chief being:—

(*a*) Survey by the chain of an area of about 20 acres.

(*b*) Survey with the magnetic compass of an area of about 25 acres.

(*c*) Theodolite traverse of an area of about 60 acres, interior details being filled in with the aid of a circumferentor.

(*d*) Tacheometrical traverse and contouring of a strip of country followed by precise levelling.

It was not found possible to continue the actual Mine-Surveying practice at the Aberllyn and Penrallt Mines, as they had been closed down.

The six weeks' course of mine work, however, was held at Tywarnehaile Mine, near Redruth, Cornwall, which afforded exceptionally favourable facilities for students to become practically acquainted with the crucial work of connecting the underground survey with the surface survey.

The survey practice in Cornwall comprised:—

1. Preliminary Reconnaissance with Compass or Plane Table over the mine sett, which is about 1 square mile in area.
2. Triangulation of the part of the sett on which mining exploration and work has been carried on.
3. Traversing with the Miner's Dial through two underlie shafts, the three shallow adits and the deep adit, the only parts of the mine at that time accessible. With the exception of one shallow adit, none of the adits could be entered directly from the surface.
4. Connecting the surface triangulation with the deep adit by a theodolite traverse through the R.R. underlie shaft.
5. Theodolite traverse of the deep adit, which, with its branches comprised a length of upwards of 3,000 feet. The adit was low, narrow and tortuous, and special methods of setting up the instruments had to be adopted, as there was no room even for the ordinary short tripod.
6. Connection of the adit traverse by tieing the survey to plumb lines in the adit shaft and in James' shaft, and making the necessary co-ordinate computations.
7. A similar connection was obtained by computation from the co-ordinates of the foot of the traverse of the underlie shaft and the co-ordinates of the plumb line in James' shaft.
8. Two plumb lines were hung in James' shaft, an interval between them of only 3·7 feet being possible. The shaft was very wet, and there was a considerable amount of air current in spite of a door being erected in the adit and the shaft being covered over at the collar. Consequently 60lb. plumb-bobs and No. 27 S.W.G. piano wires were used, the factor of safety of the wire being 1·2. Students practised two distinctly different methods of connecting on to the two plumb lines at the surface and underground, Weisbach's system and that of direct alignment being the two methods employed.
9. Stope measurements.
10. Observations for latitude.
11. Solar and stellar observations for azimuth.
12. Boundary traverse with the theodolite.
13. Running precise levels to surface traverse and triangulation stations as a basis for a tacheometrical survey.
14. Contouring the surface with the tacheometer.
15. Filling in the details of the triangulation survey on favourable ground with the chain only.
16. Minor traverses with the Henderson Rapid Traverser, Circumferentor, etc., to pick up surface details.
17. Levelling with the object of laying out new mine-buildings adjacent to John's and Gardner's Shafts.
18. Tacheometer survey of part of the Old Wheal Towan sett.

The four methods of connecting and orienting the precise underground survey afforded a most excellent opportunity to the students of comparing the practical difficulties peculiar to each method. It has never before been possible to make the practical instruction of the class so complete in this essential matter.

Very satisfactory results were obtained by the various parties. The differences of orientation referred to a common draft underground exceeded two minutes of arc only in one or two cases. Such orientation results would be quite acceptable in actual practice.

A unique object-lesson was afforded the class during its stay at the mine by the erection of gas producers and three suction gas-engines each of 135 h.p. with direct coupled electric generators, providing current for two high lift centrifugal pumps, each capable of delivering 1,000 gallons per minute against a head of 220 feet.

The thanks of the Board of Education are due to the directors of the Tywarnehaile Syndicate, Ltd., for granting the use of the mine to the class.

Visits were made to the Ore Concentration Company's testing works, Kingsland Road, E., and to the West Kitty and Wheal Kitty Tin Mines, St. Agnes, Cornwall.

During the term the following gentlemen acted as assistants for different periods, one relieving the other as they successively obtained appointments abroad:—Messrs. T. H. Bayldon, F. J. M. Huddart, W. F. Collins, J. L. Jeffery, W. S. Gifford, H. D. Maidment, C. S. Griffiths, R. C. Munro, F. H. Nash.

Results of Examinations.—The following table shows the number of students who attended the full course and the number (including re-examined students) who passed the examinations.

Branch.	No. of Students in attendance.	Examinations.		
		No. of Candidates.	No. of Passes.	No. of Failures.
Mining - -	38	39	36	3
Mine-Surveying -	44	40	32	8
"First Aid" -	31	31	24	7

The student's place in the class-list is finally determined on the basis of the marks obtained in the separate examinations in mining (including mineral dressing), mine-surveying and assaying, and of those awarded him for his work during the session. A student must, however, obtain sufficient marks to qualify in each separate division of the subject before a certificate in mining can be awarded. The final results show that of the 41 candidates (some of whom had practically qualified in a preceding year), 7 passed in the first class, 26 in the second class, and 8 failed to qualify fully. Mr. L. E. Hill was at the head of the examination list and obtained the Mining Prize presented by the Board of Education and the Scholarship in Mining annually given by the Institution of Mining and Metallurgy as well as the De la Bêche medal.

7 First Class and 22 second class Associateships were granted in Mining.

Post-Graduate Courses of practical work at mines in South Africa were arranged under the auspices of the Institution of Mining and Metallurgy. Messrs. F. Ferrers, M. Huddart, H. E. Pope, E. G. Sudlow, and D. H. Thacker were the accepted candidates.

Messrs. R. Bendall and L. A. Smith were selected for the post-graduate courses of work arranged by Messrs. Bewick and Moreing at some of their mines at Kalgoorlie, Western Australia.

Summer Course to Teachers.—A special course of twelve lectures to illustrate the methods adopted here of teaching mining were given by the Professor to a class of 12 teachers selected by the Board of Education and the Scotch Education Department. The subject dealt with was underground water, its distribution and the unwatering of mines.

A course of practical instruction in selected methods of surveying was carried on during the same period by Mr. Cooke.

Donations :—

Section of lode showing Vein Structure, Bannie Mine, Dutch West Borneo, by A. C. Claudet, Esq., A.R.S.M.. President Inst. M.M.

Diagrams of Gyratory and Jaw Rockbreakers by Messrs. Hadfield & Co.

Diagram showing fluctuations in the price of Tin from 1780 to 1906. Presented by Messrs. Henderson, Mining Engineers, Truro.

Purchases :—

Stanley 5 in. Transit Theodolite with Burt Solar Attachment.

Stanley 4 in. Mine Theodolite with a specially designed coarse and fine centering head.

Specially designed coarse and fine centering head for the Fennel Theodolite.

Stadia Rod with levels and adjustable legs for precise tacheometry.

Sopwith levelling staff.

Three 100 foot Roe steel tapes on reels. Two 100 foot Lucas steel tapes and folding reel for pocket. Three 100 foot light steel chains. Station poles. Three pocket levels for levelling staves. Four spring balances. Two 50 foot linen tapes, etc.

THE ROYAL COLLEGE OF ART.

THE ROYAL COLLEGE OF ART.

Report for the Session 1905–06.

During the Session there were in the College 140 men and 61 women students, 201 in all, as compared with 184 students in the previous Session. This number includes 21 Students-in-Training, 32 Royal College of Art Scholars, 12 National Scholars, 20 Royal Exhibitioners, 13 Local Exhibitioners, 4 Junior Art Scholars, 39 Students admitted free, and 60 fee-paying students.

The total amount received in fees was £884 18s., as against £644 4s. for the previous Session.

Thirty-two students who passed through the College obtained appointments as teachers or designers.

Architectural School.—The number of students was 58; 10 in the Upper Division, and 48 in the Lower Division.

The students of the Upper Division devoted the whole Session to the study of the architectural use of Sculpture. They began by preparing historical illustrations with designs in the various styles. A subject to be completely worked out in full detail was then set and small scale sketches, working drawings and large details produced. The subject set was a tomb for a naval hero in St. Paul's Cathedral.

The interest taken in the subject and the ability displayed by the senior students was very encouraging.

The work of the students who joined the Upper Division in the second term of the Session included Classical studies and a design for a covered bridge, Renaissance studies in the Museum, and a design for a fountain, and English domestic studies and a design for an Almshouse.

The Lower Division was as usual very largely attended during the first term of the Session, and a general course of introductory study was followed. The students prepared designs for simple subjects, illustrating the lectures and demonstrations given.

The following awards were obtained by students of this School :—

The Soane Medallion and £100 Travelling Studentship of the Royal Institute of British Architects to W. S. George. The Silver Medal of the same Institute to G. I. Coombs.

Painting School.—The number of students was 42 ; 35 in the Upper Division and 7 in the Lower Division.

The work of the students of the Upper School was chiefly Figure Composition, and though the general standard was not so high as in the previous year, yet several individual efforts were on a much higher level.

The subjects given for exercises in Composition were "Agriculture," "Peace," "Speed," "Spring," "Autumn," "Cain the Outcast," and "Commerce."

The students of the Lower School showed some very good work; the heads from life being strong in construction and more complete than before, while the compositions generally were in advance of those of former years.

The monthly Figure Compositions worked in connection with he Literary Course again reached a high standard. These frequent exercises form a valuable element in the course of training.

Modelling School.—The number of students was 42 ; 30 in the Upper Division and 12 in the Lower Division.

The work of the students in the Upper Division has been remarkably good during the year. It consisted mainly of Composition and Studies from the Life. Six students in the Men's room made excellent studies from the Model, life size. The Life studies and the Compositions of the remaining students were made to a smaller scale.

Six of the women students made excellent studies from the model, life size, as well as Compositions in the round and in relief.

In the Lower Division excellent work was done and it was much appreciated by the Visitor.

A British Institution Scholarship was gained by Miss Richardson, of the Upper Division.

Design School.—The number of students was 35, 26 in the Upper Division and 9 in the Lower Division.

The steady advance in the standard of work in this School was maintained during the year. The general average was

higher than formerly, and there was some work of remarkable ability. The advance is to be attributed to the continuity of the scheme of instruction and to the influeuce of the Craft Classes.

Craft Classes.—During the Session much good work has been done in the following Crafts:—Etching and Engraving, Stained Glass, Pottery, Writing and Illumination, Embroidery and Tapestry Weaving, Marble and Stone Carving, Furniture Decoration and Gesso work, and Metal and Enamelling.

The aim of these Classes is to give the students studying Design an opportunity of becoming practically acquainted with the capabilities and limitations of the materials used.

Literary Course.—At the beginning of the Session lectures were given on the "Life and Times of St. Francis of Assisi" and in conjunction with them the following books were studied: "Little Flowers of St. Francis," "The Mirror of Perfection" and the "Life of St. Francis" by St. Bonaventura, and it was from these works that the subjects for the monthly Figure Compositions were selected.

The remainder of the Session was devoted to Lectures on the Venetian and North Italian Schools of Painting and Italian Sculpture. At the end of the Session a test examination was held which produced excellent results, for the majority of the papers showed a close and independent study of the examples dealt with in the Lectures.

Taine's "Voyage en Italie" taken in connection with the lectures again proved most interesting and instructive reading to the students of the advanced French Class.

Training in Teaching.—During the Session 34 students acted as Assistant Teachers in the Day and Evening Classes in the College. Those assisting in the Life and Extremities of the Figure Classes gave the poses for the six days and short time studies, and also arranged the casts of drapery on the living model.

The Classes in Methods of Teaching were attended by 123 students, and several very good lectures were delivered by the senior Students in Training upon some of the Elementary subjects of the Board's Examinations.

Evening School.—Classes were held in the following subjects: —Drawing extremities of the Figure from the Antique, Anatomy, and Drawing from Life. Some excellent studies were made, and the influence of the work was clearly seen in the figure compositions.

The annual Exhibition of students' work was held at the end of the Session.

Associateship of the College.—Tests were held at the end of the session for the Full Associateship and for the Schools Associateship in Architecture, Ornament and Design, Decorative Painting, Sculpture and Modelling.

For the Full Associateship there were 12 candidates, of whom 4 were successful.

For the Associateship of the Painting School there were 11 candidates, of whom 6 were successful; for that of the Architectural School 6, of whom 4 were successful; for that of the Design School 11, of whom 8 were successful; and for that of the Modelling School 7, of whom 4 were successful.

THE GEOLOGICAL SURVEY OF GREAT BRITAIN AND MUSEUM OF PRACTICAL GEOLOGY.

THE GEOLOGICAL SURVEY OF GREAT BRITAIN AND MUSEUM OF PRACTICAL GEOLOGY.

Report for the Year 1906.

Changes in the Staff.

The following changes in the staff took place during the year :—Mr. J. G. Goodchild, who joined the field-staff of the Geological Survey in 1867, and had since 1889 been Curator of the Geological Survey Collections in the Royal Scottish Museum, Edinburgh, died on the 21st February.

Mr. T. I. Pocock resigned his position as Geologist in the spring, and Mr. G. W. Grabham, Geologist, resigned at the end of the year, in order to take up the duties of a geological surveyor under the Sudanese Government.

Mr. W. B. Wright was transferred to Scotland to fill the vacancy caused by the retirement in 1905 of Dr. Peach ; Mr. Henry Dewey was appointed Geologist on the English Staff to replace Mr. Wright ; and Mr. Bernard Smith was appointed Geologist in the room of Mr. Pocock.

Mr. E. G. W. Elliott (Second Division Clerk), was temporarily appointed to carry on the duties of Clerk in place of Mr. Dewey.

The development of the work pertaining to the office held by the late Mr. Goodchild necessitated certain reconsideration of the arrangements ; and pending the determination of the questions involved, no appointment was made to the post in 1906.

The period of Mr. H. B. Muff's services in British East Africa was extended from six to twelve months. He returned to his duties in Scotland in November. Mr. Cunningham-Craig, as arranged, remains in Trinidad.

England and Wales.—Field Work.—The work for the year has been carried out in each of the four districts :—

1. Midland District, under Mr. G. W. Lamplugh.
2. Southern District, under Mr. C. Reid.
3. South Wales District, under Dr. A. Strahan.
4. Supplementary District, under Mr. H. B. Woodward.

1. *Midland District.*—Field work was carried on in Sheets 112 (Chesterfield), and 142 (Melton Mowbray) by Mr. W. Gibson, Mr. C. B. Wedd, Mr. R. L. Sherlock, and Mr. B. Smith, under the superintendence of Mr. Lamplugh, who has also taken part in the field work. The area

surveyed amounts to 181 square miles, and has entailed the tracing of 889½ miles of geological boundary lines. Of this area, 169 square miles lie within Sheet 142 (Melton Mowbray), the survey of which has been completed. In Sheet 112 (Chesterfield), the new area surveyed is 12 square miles. Some additional data in reference to Sheet 126 (Nottingham) were also obtained.

The Dry-proof of Sheet 126 (Nottingham) has been prepared, and the greater part of the Memoir on this sheet has been written.

The Special Nottingham Map and Memoir, and the Memoir on Sheet 142 (Melton Mowbray) are in preparation.

2. *Southern District.*—Field-work was continued in Sheet 335 (Trevose Head), which was nearly finished, in Sheet 336 (Camelford), and in Sheet 359 (Lizard). Sheet 347 (Bodmin) has been completed, and work in Sheet 337 (Launceston) has been proceeded with.

The Memoir on Sheet 353 (Mevagissey) has been written, and that on Sheet 335 (Trevose Head) has been commenced. The Memoir on the Geology of Plymouth and Liskeard (Sheet 348), and that on the country east of Plymouth and around Ivybridge (Sheet 349), are in progress.

An area of 161½ square miles, with 577½ miles of geological boundary lines, was surveyed under the superintendence of Mr. Reid, with the assistance of Dr. J. S. Flett, Mr. G. Barrow, Mr. J. B. Hill, Mr. D. A. MacAlister and Mr. H. Dewey. Some additional boundary-lines were drawn by Mr. Ussher in the areas of Sheets 311, 347, and 349; the additions being necessary to complete the geological information prior to the colour-printing of the maps.

Further statistics and details relating to the mineral veins in Cornwall were obtained by the Mining Geologist, Mr. MacAlister.

3. *South Wales District.*—Field Work was carried on in Sheets 228 (Haverfordwest) and 245 (Pembroke and Tenby), under the superintendence of Dr. Strahan.

An area of 77½ square miles, with 571 miles of geological boundary lines, was surveyed in Pembrokeshire and Carmarthenshire by Dr. Strahan, with the assistance of Mr. T. C. Cantrill, Mr. E. E. L. Dixon, Mr. H. H. Thomas and Mr. O. T. Jones.

The Memoir on Sheet 229 (Carmarthen) was proceeded with, and those on Sheets 246 (Worms Head), and 247 (Swansea) were completed.

4. *Supplementary District.*—Some progress has been made with the Memoir on the colour-printed London Maps; but it is still far from complete.

The Memoir on the Water Supply of the East Riding of Yorkshire has been completed and published; while those on the Water Supply of Kent and on Northamptonshire (conjointly with Bedfordshire) have been proceeded with. Rainfall maps with statistics for the counties of Kent, Northampton and Bedford have been prepared by Dr. H. R. Mill.

Considerable assistance was rendered by Mr. Barrow in obtaining and tabulating information with regard to the strata proved in tube railways and other excavations, and in borings and well-sinkings, in the London area.

The total area surveyed in England and Wales amounts to 420 square miles, with 2,038 miles of geological boundary lines; being an average of nearly five miles of boundary to the square mile.

In addition to the ordinary field-work Mr. W. Gibson has examined the material from new borings and sinkings for coal at Bettisford, in Flintshire; at Ingleton, Selby, Thorne, Bentley, and Brodsworth in Yorkshire; and at Denby in Derbyshire. Mr. H. H. Thomas and Mr. O. T. Jones made further examination of cuttings on the new railway between Clarbeston Road and Fishguard in Pembrokeshire. Dr. Strahan prepared a concise guide to the Geological Model of the Isle of Purbeck, which has been published at 6d. This should be of educational value, both in reference to the model and on the ground, as the object has been to illustrate some of the main facts of geology in their relation to the present topographical features of the land. By the courtesy of Prof. S. H. Reynolds, Dr. Strahan was enabled to examine and take notes of some trenches on the Mendip Hills that had been dug for the purpose of further exposing the Silurian rocks discovered by Prof. Reynolds.

Assistance was given by the Home Office to Mr. MacAlister, Mining Geologist, in his work of indicating on the Geological Survey maps the metalliferous veins of parts of Cornwall; and to Mr. Gibson in reference to plans of coal-mines.

At the Geological Survey Office information has as usual been given on sanitary questions to the Local Government Board, and to various individuals. Many inquiries made personally and by letter in reference to sites of houses, water-supply, building-stones, etc., have likewise been attended to. Information was also given by the Petrographer with reference to building-stones for the National Physical Laboratory.

Evidence was given before the Royal Commission on Coast Erosion by Mr. H. B. Woodward, Mr. Clement Reid, and Dr. Strahan. Mr. Woodward was deputed to represent the Geological Survey at the 23rd Congress of the Royal Sanitary Institute held at Bristol.

The small colour-printed map of the British Islands, on the scale of one inch to twenty-five miles, was published, price 2s.; and uncoloured copies of the same are also supplied to the public.

Progress has also been made with the larger index map of England and Wales, on the new series map, scale one inch to four miles. Of the Drift Edition, Sheets 8 and 12 have been published, and Sheets 16, 20 and 24 are well advanced. Of the Solid Edition, Sheets 1, 2, 3, 4, 5, 6 and 7 are well advanced, and others are in progress.

In December, 1905, the Director conferred with representatives of the Agricultural Educational Association, with reference to the application of six-inch mapping to agricultural requirements; and it was arranged that certain representatives of the Agricultural Educational Association should visit a rural district while field-work was in progress. Accordingly in October 1906, Mr. A. D. Hall and Prof. T. H. Middleton, visited the Midland District in conjunction with Mr. Lamplugh and his colleagues. Certain areas in which the relation of the geological boundary lines to the character of the soils might be tested, were examined in detail as to the extent to which the existing methods of surveying afforded indications of value in agricultural investigation.

In the Draughtsmen's Office, under the superintendence of Mr. H. W. Gilbert Williams. the following work has been done:—

The preparation of 99 illustrations for memoirs, besides drawings and diagrams to illustrate permanent exhibits in the museum. In work affecting six-inch maps, 66 colour models, 20 standards, and 40 dry proofs have been made; 11 proofs have been checked, and 162 manuscript coloured office copies

have been made, including a considerable number of the northern counties maps, which have still to be checked before being deposited in the Library.

Of the one-inch maps 7 colour models and 1 dry proof have been made, and 12 proofs checked. Forty-one new standards have also been checked. Of quarter-inch maps 7 dry proofs and 6 colour models have been made, and 11 engraved proofs and 2 colour-printed proofs checked.

The demand by the public for MS. coloured copies of six-inch maps of England and Wales has nearly doubled that of last of year, 76 copies having been supplied. These are as follows :—Bedfordshire, 24 N.E., S.E., 28 N.W., N.E., S.W.; Buckinghamshire, 15 N.W., N.E., S.E., 20 N.W., N.E.; Cheshire, 34 N.W.; Cornwall, 51 N.W., 69 N.E., 75 N.W., N.E.; Cumberland, 79 (four quarters); Devonshire, 116 S.W.; Dorsetshire, 47 S.W.; Glamorganshire, 12 (four quarters), 17 N.E., S.E., 29 S.E., 37 N.W., 39 (four quarters), 40 (four quarters), 41 S.W., S.E., 44 (four quarters), 45 (four quarters), 49 (four quarters); Leicestershire, 24 N.W.; Monmouthshire, 23 N.W., S.W. 27 (four quarters), 28 N.W., (two copies), S.W., 32 N.E.; Northumberland, 46 N.W.; Yorkshire, 85 (four quarters), 101 (four quarters), 134, 245 S.W., S.E., 259 N.W., N.E.

Much miscellaneous work has also been executed by the draughtsmen, such as the lettering of labels for museum use, the alteration of and additions to manuscript maps previously made, tracings of coal-field areas, and the preparation of specimens of standard colours.

The following is a list of the Maps and Memoirs issued by the Geological Survey of England and Wales during the past year :—

I. Maps.

(*a*) Twenty-five Miles to One Inch.

Map of the British Islands. Price—Colour-printed 2/- ; Uncoloured 1/-.

Uncoloured copies are also supplied of an Index Map on this Scale, showing the sheets of the Four-mile and One-inch scales ; with particulars of Memoirs, Maps, Sections, etc., printed on the back. Price 1/-.

(*b*) Four Miles to One Inch.

New Series ; Drift Edition ; Colour-printed.

Sheet 8 (Flamborough and Spurn Heads). Price 2/-.
Sheet 12 (Parts of Lincolnshire and Norfolk). Price 2/6.

(*c*) One-Inch Maps (New Series).

Sheet 110 Macclesfield (Drift).
Sheet 123 Stoke-upon-Trent (Solid—2nd edition).
Sheet 246 Worm's Head (Solid and Drift).
Sheet 311 Wellington and Chard (Drift).
Sheet 326 and 340 Sidmouth and Lyme Regis (Drift).
Sheet 346 Newquay (Drift).
Sheet 352 Falmouth and Truro (Drift).
Sheet 357 and 360 Isles of Scilly (Drift).

The following Drift Map previously issued hand-coloured has been replaced by a colour-printed map :—

Sheet 341 West Fleet.

The following dry-proofs have been sent to the engraver :—

Sheet 229, Special Oxford Sheet (parts of 236, 237, 253 and 254).
Sheets 34, 35, 43, 44, 53, 54, 63, 65, for correction prior to colour-printing.

(*d*) Six-Inch Maps.

The undermentioned six-inch maps have been published with geological information, uncoloured :—

Cumberland, 67 N.W., N.E., S.W., S.E.

Colour patterns of these sheets have been prepared and despatched to the Ordnance Office, so that on demand coloured copies can be supplied.

Glamorgan, 16 N.W., N.E., S.W., S.E., 27 S.E., 35 N.E.

Colour patterns of these sheets are being prepared for despatch to the Ordnance Office.

(*e*) Six-Inch Reference Maps.

Two hundred and twenty-two MS. coloured copies of six-inch quarter sheets have been made from the field copies, and deposited in the Office for Public Reference.

These are as follows :—

Berkshire, 15 N.W., N.E., S.W., S.E., 19 N.W., N.E., S.W., S.E., 20 N.W., N.E., S.W., S.E., 21 N.W., N.E., S.W., S.E.

Buckinghamshire, 26 S.W., S.E., 27 S.W., 31 N.E., S.E., 32 N.W., S.W., 36 N.W., 45 N.E., S.E., 53 N.E., S.E., 56 N.E.

Carmarthenshire, 38 N.E., S.W., S.E., 39 N.W., N.E., S.W., S.E., 40 N.W., N.E., S.W., S.E., 41 N.W., 44 N.E., S.E., 45 N.W., N.E., S.W., S.E., 46 N.W., N.E., S.W., S.E., 47 N.W., S.W., 51 (N.E. and S.E.), 52 N.W., N.E., S.W., S.E., 53 N.W., N.E., S.W., S.E., 54 N.W., S.W., 57 S.E.

Cornwall, 32 N.E., 42 S.E. (47 N.E. with 48 N.W.), 47 S.E., 48 N.E., S.W., S.E., 49 N.W., N.E., S.W., S.E., 50 N.W., S.W., 56 N.E., S.E., 57 N.W., 58 N.E., S.E., 59 N.W., N.E., S.W., S.E., 60 N.W., (60 S.W. with 66A N.W.), 63 N.W., N.E., S.W., S.E., 66 N.W., (N.E. and S.E.), S.W., 69 S.W., S.E., 74 N.E., 75 N.W., S.W., 77 N.W., N.E., S.E.

Devonshire, 113 S.E.

Durham, 14 N.W., N.E., S.W., S.E., 21 N.W., N.E., S.W., S.E., 27 N.W., N.E., S.W., S.E., 28 N.W., N.E., S.W., S.E., 31 N.W., N.E., S.W., S.E., 36 N.W., N.E., S.W., S.E., 40 N.W., N.E., S.W., S.E., 43 N.W., N.E., S.W., S.E.

Essex, 67 S.W., S.E., 74 N.E., S.E., 75 N.W., S.W., 83 N.W. N.E. S.W., S.E.

Lancashire, 115 N.W., N.E., S.W.

Leicestershire, 3 N.W., S.W.

Lincolnshire, 95 S.W., 104 N.W., S.W.

London, 9 S.E., 13 N.E.

Middlesex, 19 S.W., 20 N.W., 24 N.W., N.E., S.E., 25 N.W., S.W., S.E.

Nottinghamshire, 33 S.E., 35 N.W., N.E., S.W., S.E., 36 N.W., 38 N.W., N.E., S.W., 39 N.W., N.E., S.W., S.E., 40 N.W., N.E., S.W., S.E., 42 N.W., N.E., 43 N.W., N.E., S.W., S.E., 44 N.W., N.E., S.W., S.E.

Oxfordshire, 26 N.W., N.E., S.W., S.E., 27 N.W., S.W., S.E., 32 N.W., N.E., S.W., S.E., 33 N.W., N.E., S.W., S.E., 34 N.W., S.W., 38 N.W., N.E., S.W., S.E., 39 N.W., N.E., S.W., S.E., 41 S.W.

Surrey, 2 S.W., 11 N.W.

Wiltshire, 39 N.E., S.E.

II. Memoirs.

Summary of Progress of the Geological Survey of the United Kingdom for 1905, pp. 204. Price 1s.

Guide to the Geological Model of the Isle of Purbeck, by Aubrey Strahan, M.A., F.R.S., pp. 26. Price 6d.

Soils and Sub-soils from a sanitary point of view, with especial reference to London and its neighbourhood, by Horace B. Woodward, F.R.S., pp. 82. Price 1s. 6d. (2nd edition.)

The Water Supply of Suffolk, by W. Whitaker, B.A., F.R.S., with contributions by H. F. Parsons, M.D., H. R. Mill, D.Sc., LL.D., and J. C. Thresh, D.Sc., M.D., D.P.H., pp. 177. Price 3s. 6d.

The Water Supply of the East Riding of Yorkshire, by C. Fox-Strangways, F.G.S., with contributions by H. R. Mill, D.Sc., LL.D., pp. 181. Price, 3s.

The Geology of the Country around Macclesfield, Congleton, Crewe, and Middlewich (Sheet 110) by T. I. Pocock, M.A., with contributions by G. Barrow, F.G.S., W. Gibson, B.Sc., C. B. Wedd, B.A., J. A. Howe, B.Sc., and notes on Fossils by E. T. Newton, F.R.S., pp. 138. Price 2s. 6d.

The Geology of the Country between Wellington and Chard (Sheet 311) by W. A. E. Ussher, F.G.S., with contributions by H. B. Woodward, F.R.S., and A. J. Jukes-Browne, B.A., pp. 68. Price 1s. 3d.

The Geology of the Country near Sidmouth and Lyme Regis (Sheets 326 and 340), by H. B. Woodward, F.R.S., and W. A. E. Ussher, F.G.S., with contributions by A. J. Jukes-Browne, B.A., pp. 96. Price 1s.

The Geology of the Country around Newquay (Sheet 346) by C. Reid, F.R.S., and J. B. Scrivenor, M.A., F.G.S., pp. 131. Price 3s.

The Geology of Falmouth and Truro, and of the Mining District of Camborne and Redruth (Sheet 352) by J. B. Hill, R.N., and D. A. MacAlister, pp. 335. Price 7s. 6d.

The Geology of the Isles of Scilly (Sheets 357 and 360), by G. Barrow, F.G.S., with petrological contributions by J. S. Flett, M.A., D.Sc., pp. 37. Price 1s.

The following Memoirs are in different stages of progress :—

The Geology of the Leicestershire and South Derbyshire Coal-field, by C. Fox-Strangways. (*In slip proof.*)

The Geology of the South Wales Coal-field. Part VII. The Geology of the Country around Ammanford (Sheet 230), by A. Strahan, T. C. Cantrill, E. E. L. Dixon, and H. H. Thomas (*In page proof*); Part VIII. The Geology of the Country near Swansea (Sheet 247), by A. Strahan, with Notes by R. H. Tiddeman, W. Gibson, and E. E. L. Dixon. (*In slip proof.*) Part IX. The Geology of West Gower and the Country around Pembrey (Sheet 246) by A. Strahan. (*In slip proof.*)

The Geology of the Southern end of the Derbyshire and Nottinghamshire Coal-field, (Sheet 125), by W. Gibson, T. I. Pocock, C. B. Wedd, R. L. Sherlock, with notes by C. Fox-Strangways. (*In slip proof.*)

The Geology of the Country around Hungerford (Sheet 267), by H. J. Osborne White. (*In slip proof.*)

The Geology of the Country around Andover (Sheet 283), by A. J. Jukes-Browne. (*In slip proof.*)

The Geology of the Lands End District (Sheets 351 and 358), by C. Reid and J. S. Flett. (*M.S. with printers.*)

The Geology of the Country around Mevagissey (Sheets 353 and 354), by C. Reid, with notes by J. J. H. Teall. (*Ready for printers.*)

Petrographical Department.—The rocks sliced for microscopical examination in the petrographical department during 1906 number 1,406, 862 being English, 472 Scotch, and the remainder Irish and foreign. This is the largest total for one year which the department has hitherto had to deal with. The slides have mostly been prepared in the Survey's workshop by Mr. John Rhodes; but as his time is largely taken up with other duties it was found necessary to send a number to outside section-cutters. Mr. Rhodes continues to curate the collections of sliced and unsliced rocks, to revise the catalogues and keep them up to date, and to despatch the rocks and slides required by officers in Scotland and in the field. The number of sliced rocks registered in the Survey's collections at the end of the year is 5,740 English, 13,108 Scotch, 20 Irish, and 1,046 Foreign.

Dr. Flett has described 494 rock-slides for the field officers during 1906. Of these, 155 were Scotch, and 339 English. In addition to these, 1,427 sliced rocks (1,138 Scotch, and 289 English) have been examined by him in connection with petrographical data required for memoirs which are in hand; and classified and named lists of these have been sent to the field officers in charge of the memoirs.

The greater part of the petrographer's time has been taken up in writing petrographical chapters for forthcoming Memoirs, of which the following have been compiled during the year:—Land's End and St. Ives (351 and 358), Plymouth (348), Camborne and Falmouth (352), Midlothian (32), Beauly (83), Loch Lomond (38), Dalmally (45), and Kilmartin (36). Mr. E. B. Bailey has revised and finished his chapter for the North Berwick and Haddington Memoir (33), while Dr. Teall has edited the petrographical portions of Gorran (353), Islay (19 and 27), and Glenelg (71). Mr. H. H. Thomas has continued to take charge of the petrography of the South Wales District, and has supplied the information required for the Carmarthen Memoir (Sheet 229). He has also examined the insoluble residues of a number of samples of chalk for Mr. Osborne White's Hungerford Memoir (Sheet 267). Mr. Barrow, under Dr. Teall's supervision, is engaged in a study of the petrography of the Ivybridge sheet (349). Mr. Dixon has prepared an account of the dolomitized limestones of the Swansea area for the memoir on that sheet (247). The petrology required for Mr. Harker's Memoir on the Small Isles (Sheet 60) has been executed by himself.

The investigation of the current material sent in by the field geologists and the answers to their inquiries, have principally been undertaken by Dr. Flett. An increasing number of field geologists have examined for themselves the slides cut from the districts which they themselves have surveyed. Mr. Bailey, Mr. Muff, and Mr. Grabham spent some time in the London office, early in the year, engaged in this work under the superintendence of Dr. Flett. By arrangement, Mr. Bailey has charge of the petrographical work connected with the Glasgow Memoir. Mr. Barrow and Mr. MacAlister have undertaken petrological investigations in Cornwall, in the districts where they are mapping.

Dr. Flett spent April, May, and June at the Lizard, mapping the crystalline rocks of that area. During part of this time Mr. Thomas very efficiently discharged the duties of superintending petrographical work in the office, and answering inquiries of a petrographical nature. He spent two months in revising the nomenclature of the Welsh rocks exhibited in the Museum.

During the year 672 rocks and 1,749 slides have been despatched by Mr. Rhodes to officers in Scotland and in the field, who desired to study the rocks of the areas in which they were mapping.

In October Dr. Flett visited Scotland to collect material and obtain information in connection with the Midlothian (32), Kilmartin (36), and Dalmally (45) Sheets. He spent some time in the Royal Scottish Museum, selecting and arranging rocks on exhibit. He has supplied names for 162

rock specimens collected for the Geological Survey gallery in the Edinburgh Museum.

The inquiries received from the outside public respecting minerals, gems, ores, building stones, road stones, erratics, gravels, &c., and from scientific men on petrological questions are very numerous. They have been dealt with, so far as they referred to this department, by the Petrographer, and often took up a large part of his time.

Mr. T. C. Hall continues to attend to the photography required for illustrating Memoirs and for exhibition in the Museum. In 1906 he took 108 photomicrographs of British rocks; 18 others were taken by Dr. Pollard and Mr. MacAlister. These are to be used to illustrate nine Memoirs and three Reports. In May and June Mr. Hall took 42 views of geological interest in the Land's End district, and in July and August he visited South Wales and took 111 photographs for Mr. Strahan; 9 photographs of implementiferous gravels at Northfleet were also taken by Mr. Hall. 71 photographic prints, including enlargements and photomicrographs, have been prepared and exhibited in the Museum. The number of negatives in the Survey's collection now numbers 803 (413 photomicrographs and 390 landscapes). Mr. Hall has spent much time in the preparation of a descriptive reference album of all the Survey's photographs, and a new consecutive catalogue is also in hand. Dr. Flett has also taken four photographs, and Dr. Pollard has kindly supplied enlargements from some of his private negatives for exhibition in the Museum.

Under Mr. Howe's supervision Mr. Hall has arranged an exhibit of maps, rocks, and photographs from the Scilly Isles for the Museum, to illustrate the recently published Memoir.

Mr. Hall has collected 75 trimmed museum specimens of rocks from Cornwall; these are partly for exhibition and partly for the collection of road stones. Mr. J. Pringle has collected 8 specimens of rocks, at Mr. Dixon's suggestion, from South Wales.

The Petrographer desires also to acknowledge gratefully the presentation of a number of rock specimens by various donors. Particulars of these will be found in the list of presentations. The Zambesi rocks presented by Mr. Lamplugh are of special interest.

Chemical Work.—For the first four months of the year Dr. Pollard was engaged on work in connection with the South Wales Coals, on the Dolomites of Sheet 247, and the examination of chalks for Mr. Osborne White. During this time Mr. Radley was engaged on rock analysis, and Mr. MacAlister (for the latter half of January and the first half of February) in the estimation of tin in 23 Cornish samples, and in assaying two specimens from the same district. In May and June, amongst other analytical work, nine coals from South Wales and two from Scotland were analysed by Dr. Pollard, whilst Mr. Radley continued rock analysis. From July to the end of the year rock analysis was carried on, with little interruption, by Dr. Pollard and Mr. Radley. In all, 15 complete coal analyses, 20 complete rock analyses, and 27 assays were reported on by the Chemical Department.

Such assistance as has been possible in the way of partial analyses, qualitative analyses, information, etc., has been given to the Field and Museum Staffs.

Palæontological Department.—Upwards of 8,000 specimens have been added to the collections and registered in the books during the year. Of these, 5,834 were collected for the purposes of current work in the field, and the remainder represent gifts and purchases. The fossils presented to the Museum during the year are enumerated in the list of donations printed on pages 98–101. The most important suite of specimens acquired by purchase comprises a large number of Cephalopoda from the Speeton series, obtained from Mr. C. G. Danford, who collected these fossils with special regard to their zonal distribution. Most of the specimens collected during the course of the Survey work were obtained from the Palæozoic rocks (Cambrian to Carboniferous inclusive) of Pembrokeshire and Carmarthenshire; but sets

of fossils from the Devonian, Carboniferous, Jurassic, Cretaceous and Post Tertiary rocks of English counties have also been received.

Dr. Kitchin and Mr. Allen were principally engaged during the year in carrying on the routine work of the office and Museum, and in preparing lists of fossils and revising the palæontological portions of several Memoirs. Dr. Kitchin completed the determination of a series of Jurassic invertebrate fossils from the Islands of Eigg and Muck, and in the early part of the year visited Edinburgh and made recommendations for the conduct of palæontological work in the Scottish Office. Mr. Allen has made good progress with the preparation of a manuscript catalogue of the large series of Tertiary Vertebrata in the Museum, and this work is now nearing completion. His attention was occupied for some time with the final preparation, and passage through the Press, of his catalogue of types and figured specimens of Oolitic Lamellibranchiata. He also arranged a case for the reception of fossils newly added to the Museum, where such additions will be temporarily on view before they are removed to permanent positions in the collection. In the early part of the year a case was set apart by Mr. Howe for a temporary exhibit of specimens to illustrate Memoirs newly published, and a series of fossils was selected and arranged by Mr. Allen for this case, with reference to the Memoir on "The Geology of Sidmouth and Lyme Regis."

A very large number of specimens illustrating the palæontology of formations ranging from the Ordovician to the Cretaceous have been examined and named by Dr. Ivor Thomas for the purposes of the current Survey work. In addition to this and other duties connected with the work of the office, Dr. Thomas visited Bristol in the month of July, and in company with Dr. Arthur Vaughan, examined sections in the Carboniferous Limestone of that district. With the kind collaboration of Dr. Vaughan it was possible to secure a useful reference-set of specimens in illustration of Dr. Vaughan's work on the zonal palæontology of the limestones.

During the year 6,320 specimens have been examined by specialists who are not members of the staff. The nomenclature of the greater number of these, forming part of the Museum collection, has been subject to revision, whilst the remainder, which belong to the Survey reference-collection, have been authoritatively named. Mr. E. A. Newell Arber, Dr. Wheelton Hind, Mr. P. Lake, Dr. C. A. Matley, Mrs. Shakespear (Miss Wood) and Mr. Henry Woods have devoted time to this important work, and Dr. R. H. Traquair has also obligingly named some fish remains of Devonian and Carboniferous age. Mr. R. Kidston has received collections of plants from the Coal Measures of Pembrokeshire, Carmarthenshire and the Forest of Wyre, and has continued the preparation of his special Memoir on the Coal-plants.

During nine months of the year Mr. John Pringle was principally engaged in collecting fossils required for the progress of the Survey work in South Wales, and he also obtained the series of plants from the Coal Measures of the Forest of Wyre for the purposes of Mr. Kidston's Memoir. He collected upwards of 4,000 specimens in all. While in the office he was occupied in arranging and putting into permanent storage a large amount of palæontological material, and in keeping the reference-catalogue in an efficient state.

Mr. S. W. Morgan has continued to devote a certain amount of time to the registration of fossils in the Museum collection, and has made satisfactory progress with this much-needed work. He has been necessarily much occupied also in dealing with the materials examined by specialists, a task involving considerable clerical labour.

The collection of fossils in the Museum has been consulted even more largely than before by specialists, students and others. Enquiries have been answered and information given to many applicants, while specimens to the number of 1,154 have been lent to geologists and palæontologists for the purposes of special study.

Museum of Practical Geology.—The total number of Visitors to the Museum during the year has been 57,752. This number represents 38,395 upon Week-day mornings, 11,698 on Monday and Saturday Evenings, and 7,659 on Sundays.

A list of donations to the Museum is given on pp. 98–101.
The programme for the year 1906 has been carried out, viz.:

1. The re-arrangement of the large new room as an extension of the Museum has been continued; more than half the space is now open to the Public.

2. The Exhibition of Clays has been increased by the completion of the China Clay Case. Further, all the unsorted Clay material has been sorted, cleaned, and put into a state that will make it possible to arrange an exhibit during the ensuing year.

3. The exhibit of Tested Road Stones has been permanently set up together with the photomicrographs and tables. Sections of many more roadstones which have been tested as for roadmaking during the year, have been cut in the Petrographical Department and have been added to the collection.
   Much interest has been displayed in this work, which has resulted in a considerable amount of correspondence.

4. Two new cases have been added to the Building Stone Series. These have been temporarily filled, but the work of labelling remains to be done.

Exhibits of Maps have been prepared for the Exhibition at New Zealand, for the Colliery Exhibition at the Agricultural Hall, and for the Geologists' Association.

In co-operation with the Palæontological and Petrographical Departments cases have been prepared to illustrate the Geology of the areas described in the "Sidmouth and Lyme Regis" and "Scilly Isles" Memoirs.

Numerous classes and parties have visited the Museum and several demonstrations have been given by the Curator.

In the Mineralogical division Mr. A. Pringle has continued the task of cleaning and re-labelling a large number of specimens, and a special case for large specimens has been fitted and is now completed. In addition Mr. Pringle has devoted much time to verbal enquiries.

The Library.—Additions have been made to the library, as usual, by purchase, donation and exchange.

Scotland—Field Work.

1. West Highland District.—In Sheets 53 and 28, mainly in the County of Argyll, Mr. Clough, as District Geologist, with the co-operation of Mr. Wilson, Mr. Wright, Mr. Bailey, and Mr. Grabham, mapped 44 square miles with 337 miles of boundary lines. During the summer, field work was continued in the deer forest areas between Glen Etive and Ben Nevis (Sheet 53). In the autumn, the mapping of South Knapdale was resumed, and Sheet 28 was finished.

The Memoirs on Sheet 36 (Crinan, Kilmelfort and the Isles of the Sea); of Sheet 60 (the Small Isles); of Sheet 45 (Oban and Dalmally), and of Sheets 19 and 27 (Islay, Oronsay, and part of Jura), have been completed.

2. North Highland District.—In this district, which includes parts of the Counties of Inverness, Ross, and Caithness, the field work was carried on by Mr. Hinxman, as District Geologist, with the assistance of Dr. Crampton Mr. Anderson, Mr. Carruthers, and in the autumn by Dr. Horne. The area surveyed amounted to 204 square miles, with 771 miles of

boundary lines. During the summer, the unfinished areas between Loch Carron and Glen Cannich (Sheet 82) were mapped, and that Sheet is now completed. Field work was also continued to the north and west of the River Dulnan (Sheet 74), and in Caithness (Sheet 116). At the close of the Highland season, Sheet 116 was completed. The Memoirs of Sheets 93, 71, and 64 have been proceeded with, and the Memoir on Sheet 83 is nearly completed.

Revision of the Carboniferous Areas.

During 1906, the members of the staff directed their attention to the area included in the Glasgow district map and adjacent tracts to the east and west. At the close of the year, the whole of the Carboniferous area of that district map was revised; the small areas, which were not re-examined, consist of contemporaneous volcanic rocks, and of upper Old Red Sandstone.

3. Coatbridge and Motherwell District.—The field work was under the supervision of Mr. Clough, who was assisted by Mr. Wright, Mr. Bailey, and during part of the season by Mr. Anderson and Mr. Grabham, and together they revised 38 square miles with 151 miles of boundary lines. Mr. Clough and Mr. Wright re-examined an important area of Coal Measures near Airdrie and Shettleston, while Mr. Bailey, Mr. Anderson, and Mr. Grabham revised tracts of contemporaneous volcanic rocks of Lower Carboniferous age, partly in the Campsie Fells, south of Fintry, and partly in the Renfrewshire Hills, south-west of Strathblane.

4. Glasgow and Denny District.—Mr. Hinxman as District Geologist, with the co-operation of Mr. Wilson, Dr. Crampton, Mr. Anderson, and Mr. Carruthers, revised 64 square miles with 278 miles of boundary lines. This district embraces part of the city of Glasgow, the tract between Cathcart and Bothwell, and an area extending north-eastwards from Chryston by Cumbernauld to Denny. Mr. Hinxman completed the revision of the Carboniferous rocks within the city, and continued the mapping of the Millstone Grit area eastwards beyond Chryston. Dr. Crampton re-examined the outlier of Coal Measures at Banknock and Dennyloanhead east of Kilsyth, and worked eastwards along the belt of Carboniferous Limestone strata between Kilsyth and Denny. Mr. Wilson revised the tract of Carboniferous red sandstones overlying the Lower Coal Measures round Uddingston; Mr. Carruthers re-examined the area of Coal Measures west from Cambuslang; and Mr. Anderson, the volcanic rocks of the Cathkin and Dechmont Hills, south of Rutherglen and Cambuslang.

The Memoir of Sheet 32 (Edinburgh, Dalkeith, Queensferry, and West Calder) is completed, and the Memoir of Sheet 33 (Haddington, Dunbar, and North Berwick) is nearly completed.

The total area surveyed in the Highlands during 1906 amounts to 248 square miles with 1,108 miles of boundary lines.

The total area revised in the Carboniferous districts of the midland valley of Scotland amounts to 102 square miles with 429 miles of boundary lines.

Indoor Work.—The Memoir on "The Oil Shales of the Lothians" has been published.

The Memoir on "The Geology of the North West Highlands," which has been edited by Sir A. Geikie, has been completed and is in the hands of the printers.

The Memoir on "The Geology of Islay, Oronsay, and part of Jura" is now in paged proof sheets.

Mr. Harker, Mr. Barrow, and Dr. Kitchin have finished the Memoir on "The Geology of the Small Isles" (Sheet 60).

Dr. Peach and Dr. Flett have completed the remaining portions of the Memoir of Sheet 45 (Oban and Dalmally).

Dr. Flett has finished the petrographical chapter for the Memoir of Sheet 36 (Crinan, Kilmelfort, and the Isles of the Sea), and Dr. Peach has completed his portion of that explanation.

Mr. Wedd has nearly completed his descriptions of the Secondary rocks for the Memoir of Sheet 71 (the south-east part of Skye, Glenelg, and Loch Alsh), and Mr. Woodward has completed his notes on parts of the area.

Mr. Hinxman, Dr. Crampton, and Dr. Peach have finished their portions of the Memoir of Sheet 93.

Mr. Hinxman and Dr. Peach have finished their portions of the Memoir of Sheet 83 (Beauly and Strathpeffer).

Mr. Barrow has made further progress with his description of the glacial and recent deposits for the Memoir of Sheet 64 (Forest of Atholl and Ben MacDhui).

Dr. Flett has completed the petrographical chapters on the Old Red Sandstone and Carboniferous Igneous Rocks for the Memoir of Sheet 32 (Edinburgh), and Dr. Peach has finished the description of the areas revised by him.

Mr. Barrow and Mr. Bailey have completed their account of the igneous rocks for the Memoir of Sheet 33 (East Lothian).

Twenty-six quarter sheets (New Series) six-inch scale, including parts of Mid Lothian, East Lothian, and Linlithgowshire, have been dry-proofed.

In continuation of the scheme of preparing type copies of all journals of bores in the Scottish Office, the records of 141 bores were typed during 1906, comprising 255 foolscap pages of MS. These referred to Carboniferous areas in the Counties of East Lothian, Mid Lothian, West Lothian, Lanark, and Fife.

Petrographical Work.—During last season the fossil collectors gathered 645 rock specimens. Of these Mr. Macconochie collected 84 specimens from the Counties of Perth and Argyll and Mr. Tait 561 from Fife and the Lothians, Stirling, Dumbarton, and Argyll.

Palæontological Work.—Dr. Crampton has furnished the following statement of the palæontological work done in Scotland during 1906.

The total number of fossils collected during the year and entered in the Survey List Books amounts to 1,224, chiefly from the Carboniferous areas in the Counties of Haddington, Mid Lothian, Peebles, Linlithgow, Lanark, Dumbarton, Renfrew, and Stirling. Of these Mr. Macconochie collected 188 and Mr. Tait 1,036. The fishes have been named by Dr. Traquair, the lamellibranchs. by Dr. Wheelton Hind, and the plants by Mr. Kidston. Some of the fossils have not yet been determined.

Museum Work.—A certain amount of re-arrangement of rock specimens and fossils has been carried out by Mr. Macconochie during last year. A series of rock specimens from the Counties of Argyll and Perth, named and described by Dr. Flett, have been added to the collections.

A number of fossil fishes collected by the Geological Survey from Caithness and named by Dr. Traquair have been placed in the cases.

Photographic Work.—During last season Mr. Lunn added 100 photographs to the Geological Survey collection, illustrating the geology of the Counties of Ross and Argyll.

The following is a list of Maps and Memoirs issued and in preparation by the Geological Survey of Scotland during 1906 :—

I. Maps.

(*a*) One-Inch Maps.

Sheets 13, 21, 55 (Drift Editions), published.
„ 32 (2nd edition), 36, 45, 60, 71, 86, 92, engraving.
„ 33 (2nd edition), 64, 83, dry-proofing.

(*b*) Six-Inch Maps. New Series.

Edinburgh.	Uncoloured with Geological Information.	
„	1 S.W., S.E.	Published.
„	3 N.W., S.W.	
„	4 N.W., S.W., S.E.	
„	8 N.E., S.W.	
„	14 N.W., N.E., S.W., S.E.	
„	4 N.E.	Passed for Printing.
„	8 N.W., S.E.	
„	13 S.E.	
„	3 N.E., S.E.	Engraving.
„	7 N.E., S.E.	
„	12 S.E.	
„	13 N.W., N.E., S.W.	
Linlithgow	2 N.W. and S.W. (one sheet)	Dry proofed.
„	6 N.W., S.W., S.E.	
„	10 N.W., S.W.	
Edinburgh	5 N.E., S.E.	Dry proofed except Indexes now being prepared.
„	9 N.W. (and Haddington 14 N.W.), S.W., S.E.	
„	11 N.W., S.W.	
„	15 N.W. (and Haddington 18 N.W.)	
„	18 N.E.	
„	19 N.W., N.E.	
Haddington	4 S.W., S.E.	
„	9 N.W., N.E., S.W., S.E.	
„	14 N.E.	
Linlithgow	2 S.E.	
„	3 S.W.	

(*c*) Four Miles to One Inch (Index Map).

Sheets 16 and 17, colour printing.
Sheet 12, engraving.
„ 15, dry proofing.

Map for the N.W. Highland Memoir. Engraving.

II. Memoirs.

Published Memoirs.

Economic Memoir.—The Oil Shales of the Lothians. Part I.: The Geology of the Oil Shale Fields, by H. M. Cadell, B.Sc., F.R.S.E., and J. S. Grant Wilson; Part II.: Methods of Working the Oil Shales, by W. Caldwell; Part III.: Chemistry of the Oil Shales, by D. R. Stewart, F.I.C. Price 4s.

The following Memoirs are in various stages of progress :—

1. The Geology of Islay, Oronsay, and part of Jura. (Sheets 19, 27, and part of 20.) (*In paged proof sheets.*)

2. The Geology of the North-West Highlands. (Sheets 91, 100, 101, 107, 113, and parts of Sheets 61, 71, 81, 82, 92, 102, 108, and 114.) (*In hands of the printers.*)

3. The Geology of the Small Isles. (Sheet 60.) (*Completed.*)

4. The Geology of the District between Oban and Dalmally. (Sheet 45.) (*Completed.*)

5. The Geology of the District around Kilmelfort, part of Knapdale, and the Isles of the Sea. (Sheet 36.) (*Completed.*)

6. The Geology of the S.E. part of Skye, with portions of the mainland between Loch Carron and Loch Hourn. (Sheet 71.) (*Nearly completed.*)

7. The Geology of the Beauly and Strathpeffer District, with part of Black Isle. (Sheet 83.) (*The portion of the MS. by Mr. Hinxman and Dr. Peach completed.*)

8. The Geology of the Country between Garve and Strathcarron. (Sheet 93.) (*The parts by Mr. Hinxman, Dr. Crampton, and Dr. Peach completed.*)

9. The Geology of the District between the Forest of Atholl and Ben Macdhui. (Sheet 64.) (*In preparation.*)

10. The Geology of South Knapdale and Part of Jura. (Sheet 28.) (*Mr. Grabham's MS. completed.*)

11. The Geology of the Area embraced within the Glasgow District Map. (Parts of Sheets 30 and 31.) (*Mr. Grabham's MS. completed.*)

12. The Geology of the Neighbourhood of Edinburgh (New Edition). (Sheet 32.) (*Completed.*)

13. The Geology of East Lothian, including Parts of the Counties of Edinburgh, Haddington, and Berwick. (Sheets 33, 34, and 41.) (*Nearly completed.*)

The following copies of six-inch sheets have been completed and deposited in the office for reference :—

Argyll 44, 58, 99, 169, 179, 190.
Caithness 1, 14.
Inverness, 7, 14 and 25, 32, 33.
Nairn, 11, 12.
Ross, 96, 106, 107, 113, 114 and 121.

Clean copied as far as surveyed in 1905 (lines, colour, notes) :—

Argyll, 46, 60, 170, 180.
Caithness, 2, 6, 7, 12, 13.
Inverness, 8, 15, 16, 34, 46.
Ross, 85, 95, 112.

Clean copied as far as surveyed in 1905 (lines and colouring only) :—

Argyll, 45, 191.

Clean copied as far as surveyed in 1905 (lines only) :—

Argyll, 59, 200.
Inverness, 45.
Ross, 119.

Clean copied, areas surveyed 1902-4 (lines, colour, notes) :—

Argyll, 60.
Inverness, 21, 30.
Ross, 105, 112.

Sheets previously reported for lines and colouring to which notes have now been added :—

Argyll, 19, 30, 31, 59.
Inverness, 8, 16, 101.
Ross, 23, 25, 95.

In addition to the clean copying, the draughtsmen have prepared MS. coloured copies for the public of the following six-inch sheets :—

Ayr, 6, N.E., S.E.
Edinburgh, 3 N.E.
„ 10 N.E.
Linlithgow, 1 S.W.
„ 8 N.E.
„ 9 N.W.
„ 12 N.W.

They have also spent considerable time on the following :—

(1) Colouring and preparing proofs. (2) Preparing standard pattern copies (solid and drift). (3) Checking colourist models (solid and drift). These include the following :—

Four Miles to One Inch (Index Map).

Sheets 16 and 17 (engraved proofs).

Map for North-West Highland Memoir (engraved proof).

One-Inch Map.

Sheets 13, 21, 45, 55 (engraved proofs), 32 (partly engraved).

Six-Inch Maps.

Edinburgh, 1 S.W., S.E. ; 3 N.W., S.W. ; 4 N.W., N.E., S.W., S.E. ; 8 N.W., N.E., S.W., S.E. ; 13 S.E. ; 14 N.W., N.E., S.W., S.E. (engraved proofs.)

Skye, 38, 39, 44, 45 (colourist models).

Preparing dry proofs of four one-inch maps and twenty-six new series six-inch maps.

Preparing sections, plans and sketch maps for Memoirs 32, 33, 60, 71 ; and for the Islay Memoir, North-West Highland Memoir, and Summary of Progress.

Preparing portions of MS. copies Sheets 28, 53, 71, 83.

Preparing statement of approximate number of square miles in Carboniferous areas in Scotland.

Preparing Index Maps for Annual Report.

During last year, numerous applications have been made for geological information for economic purposes. The most important of these inquiries refer to the sinking of bores to prove the existence of oil-shales at the south end of the Midlothian basin, and of coals in the Carboniferous Limestone Series in the midland valley, to the occurrence of pure quartzite and vein quartz for the manufacture of silica fire-bricks, and to limestone and shale for cement works. Information has also been asked with reference to water supply and building sites.

TABLE I.—ENGLAND & WALES.—ABSTRACT OF WORK DONE DURING THE YEAR 1906.

Counties.	Surveyors.	Square Miles Surveyed.	Miles of Boundary Traced.	Rock Specimens Collected.	Micro-scopic slides prepared	Fossils Collected.	Geological Photo-graphs taken.	Memoirs Published.	Four-Mile Maps Published	One-Inch Maps Published.	Hand-coloured maps replaced by Colour-printed Maps.	Six-Inch Maps Published.	MS. copies of Six-Inch Maps Deposited.
1. MIDLAND DISTRICT.													
Derbyshire, Leicestershire, Lincolnshire, Nottinghamshire.	5	181	889½										
2. SOUTHERN DISTRICT.													
Cornwall (Small Parts). Devonshire. Somersetshire.	7	161½	577½	83	1,406	5,834	292	11	2	8	1	10	222
3. SOUTH WALES DISTRICT.													
Carmarthenshire. Pembrokeshire.	5	77½	571										
TOTALS	—	420	2,038	83	1,406	5,834	292	11	2	8	1	10	222

Table II.—Scotland.—Abstract of Work done during the Year 1906.

Districts.	Surveyors.	Square Miles.		Miles of Boundary Traced	Rock Specimens Collected.	Fossils Collected.	Geological Photographs taken	Memoirs Published.	One-inch Maps Published.	Six-inch Maps Published.	MS. Copies of 6-in. Maps deposited.
		Surveyed.	Revised.								
District I. (West Highlands) Argyll. Inverness.	5	44	—	337	645	1,224	100	1	3	13	19
District II. (North Highlands) Ross. Inverness. Caithness.	5	204	—	771							
District III. Coatbridge. Motherwell.	5	—	38	151							
District IV. Glasgow. Denny.	5	—	64	278							
Totals	—	248	102	1,537	645	1,224	100	1	3	13	19

Statement showing the number of Geological Maps and Sections issued by the Ordnance Survey to Agents during the year ended 31st December, 1906.

Particulars.		England. and Wales.	Scotland.	Total.
ONE INCH SHEETS :—				
Old Series : Whole Sheets	solid	224	441	665
	drift	100		100
Quarter Sheets	solid	1,231		1,231
	drift	341		341
New Series : Hand-coloured	solid	30		30
	drift	36		36
Colour-printed	solid	294		294
	drift	1,118		1,118
FOUR MILE MAPS :—				
Colour-printed		415		415
SIX INCH SHEETS :—				
County maps	sheets	232	115	347
	quarter-sheets	420	49	469
TWENTY-FIVE MILE MAPS :—				
Coloured		617		617
Uncoloured		71		71
Index		35		35
Horizontal Sections		133	11	144
Vertical Sections		182	9	191
Index to Colours and Signs				
One Inch Scale Maps, Great Britain		1		1
Total		5,480	625	6,105

LIST OF DONATIONS TO THE MUSEUM OF PRACTICAL GEOLOGY DURING THE YEAR 1906.

ALDRIDGE, G., Esq.—Clay and Clay products from Aldeburgh-on-Sea.

ALLOM, C. C., Esq.—A polished section of Sodalite from the Princess Mine, Hastings Co., Ontario.

BAKER, C. J. S., Esq.—Argentiferous Cobalt and Nickel Ore from O'Brien Mine, Cobalt Lake, Ontario.

BARNES, W. F., Esq.—Pyroxene-Andesite from Moon's Hill Quarry, Stoke Lane, Somerset.

BARRATT, W., Esq.—A specimen of *Phacops latifrons* from Bray Hill, St. Minver, Cornwall.

BRINDLEY, WM., Esq., F.G.S.—White Marble from Benmore.

BURLS, H. F., Esq.—Radiated crystals of Tourmaline in Pegmatite, from Cornwall.

CARDIN, J. H., Esq.—Iron Pyrites from a Sulphur Spring near Matlock Bath.

CASTLEMAN, C., Esq.—Native Bismuth from Wermland, Sweden.

CLERK, Col.—A sample of "Black Sand" from Essequibo River, British Guiana.

Clerk, G. R., Esq.—Five specimens of variously-coloured Chalcedony from near Lake Rudolf, British East Africa.

Cooksey, D., Esq.—A polished section of stalactitic Agate.

Coomaraswamy, A. K., Esq., D.Sc.—Garnet-bearing Khondalite from near Pattipola, and a sample of Thorianite from Hinidum, Ceylon.

Corbet, A. R., Esq.—A large crystal of Cassiterite from a Wolfram Mine in Portugal.

Cousens, H. S., Esq.—Two specimens of Prehnite, one crystallised and the other stalactitic, from near Beaufort West, South Africa.

Coxworthy, Franklin, Esq. (the late)—Fossil wood in an ironstone Concretion, from Wrecclesham, Surrey.

Crawford, J. W., Esq.—Samples of French Limestones.

Danford, C. G., Esq.—Five specimens of Belemnites from the *B. lateralis* beds, and five from the *B. brunsvicensis* beds, of Speeton, Yorkshire.

Davies, H. N., Esq., F.G.S.—Three mandibles of *Microtus ratticeps* and three of *M. gregalis*, from a cave near East Clevedon, Somerset.

David, Prof., T. W. Edgworth, F.R.S.—Amphibolite from near Forth, Diabase from near Launceston, and two ice-striated boulders from the Permo-Carboniferous Glacial Beds near Table Cape, Tasmania; and Tinguaite from Evidence Valley, near Mount Kosciusko, and Glendonite from Glendon Huskisson, near Sydney, New South Wales.

Ellis & Everard, Messrs.—Samples of Granite from the Bardon Hill, Charnwood & Markfield Quarries.

Fitzmaurice, C. E. A., Esq.—A large specimen of Jamesonite from Trevinnick Mine, Wadebridge, Cornwall.

Flett, J. S., Esq., M.A., D.Sc.—A specimen of *Pterichthys milleri* from the Old Red Sandstone of Achanarras, Caithness, and two Ammonites from Eathie, near Cromarty.

Fowler, W., Esq.—An Ammonite from the Marlstone at Duke's Pit, Woolsthorp, Grantham.

Fox, Howard, Esq., F.G.S.—Two specimens of Rock from the Lizard.

Frames, M. E., Esq., F.G.S.—A series of Upper Jurassic Mollusca from near Kilindini, Mombasa, and a series from the Raised Coral Beach of Mombasa, British East Africa.

Gamble, W., Esq.—A series of Bryozoa from the Chalk of Belgium.

Gipps, W. C. R., Esq.—A specimem of Trachyte from Urombomg, Gower Co., N.S.W.

Glover, Dr. J. G., J.P.—A specimen of *Cliona cretacea* from the Gravel of Walton-on-the-Hill.

Gostwyck, G. H. G., Esq.—A specimen of Zinc Blende from near Creagan Station, Argyllshire.

Holt, A. T., Esq.—A sample of Petworth Marble with *Viviparus sussexiensis*.

Isler & Co., Messrs. C.—A Model of an Artesian Well boring.

Jones, Rev. D. L., M.A.—Coal showing concentric structure and conchoidal fracture, from South Wales.

Kenny, W. H., Esq.—Eighteen specimens, consisting of Amethyst, epimorphous Quartz, Chalcedony, Common Opal, baked columnar Sandstone, dolomitic Limestone and calcareous Quartzite, with seventeen native Implements worked in various Stones, from the Charter District, Rhodesia.

Lambeth, Wm. C., Esq.—Samples of Clay from the Chawley Timber, Brick and Tile Works, Botley, Oxfordshire.

Lamplugh, G. W., Esq., F.R.S.—114 Specimens illustrating the Geology of the Zambesi Basin around the Batoka Gorge, Rhodesia; and a series of Mesozoic Fossils from the Railway Cuttings on the mainland west of Mombasa, British East Africa.

MacAlister, D. A., Esq., F.G.S.—Samples of the Bituminous Limestone worked near Scafa, Abbruzo, Italy.

McCarthy, E. T., Esq., A.R.S.M.—Red Crystalline Corundum associated with Kyanite and Fuchsite, from the Murchison Range, Transvaal.

MacIntyre, E. A., Esq.—A sample of Mica from Klondyke.

Mainwaring, Col., F.R.G.S.—Small crystals of Spinel from the Ruby Mines of Mogok, Upper Burma.

Male, Dr. N. C. & Mr. G. E.—A series of bones of *Equus caballus*, *Ursus spelæus*, *Canis lupus*, *C. vulpes*, *Microtus ratticeps*, *M. agrestis*, and *M. gregalis* from a cave near East Cléveden, Somerset.

Marshall, E. L., Esq.—Radiated Calcite from near Exmouth, Devon; and a specimen of Tantalite from Pilbarra Goldfield, West Australia.

Moody, W., Esq.—Three samples of Volcanic Ash taken at nine miles from Vesuvius, in April, 1906.

Moylan-Jones & Co., Messrs. — A drop-cut Reconstructed Ruby; weight, 0·445 gram.

Moysey, Dr. L., M.A.—Two Seeds, two specimens of *Prestwichia*, a Calamitean, a specimen of *Calamitina* showing scars of appendicular organs, one of *Calamocladus equisetiformis*, and one of *Trigonocarpus* from the Coal Measures N.W. of Ilkeston, Derbyshire.

Newmarch, H. W., Esq.—A sample of Cobalt and Nickel Ore associated with Chalcopyrite and Dolomite, from Carmenes Mine, Leon, Spain.

O'Driscoll, F., Esq.—Two specimens of coal with fossiliferous country-rock from Mendoza, crystallised Enargite, and Silver Selenide from Rioja, Argentina.

Peard, Miss—Two specimens of Volcanic Ash from the eruption of Vesuvius in April, 1906; collected at Naples.

Perceval, Spencer G., Esq.—A sample of Cerussite from St. Cuthbert's Mine, Priddy, Somerset.

Pontifex, A. R., Esq.—A series of fine specimens from Tasmania, consisting of Chalcopyrite, Bornite, and Tetradedrite from Mt. Lyell Mines; Stannite from Oonah Mine; Galena from Montana Mine; Crocoite from Dundas; Cassiterite associated with Zinc and Copper Ore from Rex Mine; Axinite associated with Copper Sulphides from Colebrook Mine; and a sample of Soapstone.

Reader, W., Esq.—A fragment of a Fish Jaw from the Lower Chalk of Beachy Head.

Reuter's Telegram Co.—Volcanic Ash from the eruption of Vesuvius in April, 1906.

Rodda, I. T., Esq.—Cornish Granite showing large cross formed by crystals of Felspar; and a large model in Plaster of Paris of Twinned Felspar.

Rumbold, W. R., Esq.—A specimen of *Dalmanites* from Santa Vela Cruz, Ichoca, Bolivia.

Russell, Arthur, Esq.—Barytes with Quartz from Teign Valley Mine, and Smaltite with Niccolite from Wheal Emma, Devon; Bertrandite from Cornwall; Arsenopyrite with Chalcopyrite from Clogau Gold Mine, Dolgelly; Fluorite with Calcite from Castleknock Quarry, Co. Dublin; and Stalactitic Limonite from Rozsnyo, Görmör, Hungary.

Rutherfurd, W. G., Esq.—Specimens of Precious Opal from White Cliffs, N.S.W.

Scharff, Dr. R. F., on behalf of the Irish Cave Committee.—A series of Bird and Mammalian Bones from the Caves of Ireland.

Simmons, J. B. Lintorn, Esq.—A sample of Coal from Abu Triefeh, 30 miles west of Akabah, Sinai Peninsular.

Smith, A. E., Esq.—A specimen of *Solenopora* from the Oolites of Gloucestershire.

The Somerset Trading Co.—Samples of Clays and Clay products.

Spence, Messrs. Peter & Sons, Ltd.—Samples of minerals used in the manufacture of Aluminous products.

Sully, Thos. N., Esq.—Samples of Clay and Clay products from Poole Brickyard, near Wellington, Somerset.

Tata Iron and Steel Co.—Three samples of Hæmatite and one of Magnetite, illustrating the Iron Ore deposits of Gurumaishini, Mayurbhanj State; Dhullee Rajara, Raipur District; and Lohara, Chanda District, India.

Thomas, Messrs. Wm., & Co.—Samples of Clay and Clay products from the New Road Brick Works, Taunton.

Thompson, A. Beeby, Esq., F.G.S.—A translucent Hydrocarbon or Resin from Trinidad, West Indies.

Tiddeman, R. H., Esq., M.A.—A specimen of *Ditrupa* from the Middle Lias of Kingham Hill, Oxfordshire.

Tyee Copper Co., Ltd.—Gold and Silver-bearing Copper Pyrites from Mount Sicker, Vancouver Island, B.C.

Vautin, Claude T. J., Esq.—A fine sample of Chalcocite from Tonguiririca Valley, S.W. of Santiago, Chili.

Whitaker, W., Esq., B.A., F.R.S.—A specimen of *Orthoceras annulatum* from the Aymestry Limestone N. of Birchwood, Malvern.

White, Mr.—A fine sample of Molybdenite, and one of Copper Pyrites with Molybdenite, from Kvina Mines, near the Fletckefiord, Stavanger, Norway.

Wickes, W. H., Esq.—Specimens of Cotham or Landscape Marble from Redland, Bristol; and specimens of the Rhætic Bone-Bed, one from Aust Cliff, and two showing junction with, respectively, the Old Red Sandstone and the Carboniferous formations at Lilliput, Yate, Gloucestershire.

Willoughby, Sir John, Bart.—A series of specimens illustrating the Sombula Diamond Field, near Gwelo, Rhodesia, consisting of fourteen cut, and numerous uncut precious stones; viz., Diamond, Sapphire, Ruby, Chrysoberyl, Cat's Eye and Blue Topaz; and a sample of the country-rock, and of the matrix and minerals contained therein, viz., Staurolite, Kyanite, Rutile and Tourmaline; also eight Photographs showing the deposit and the method of working.

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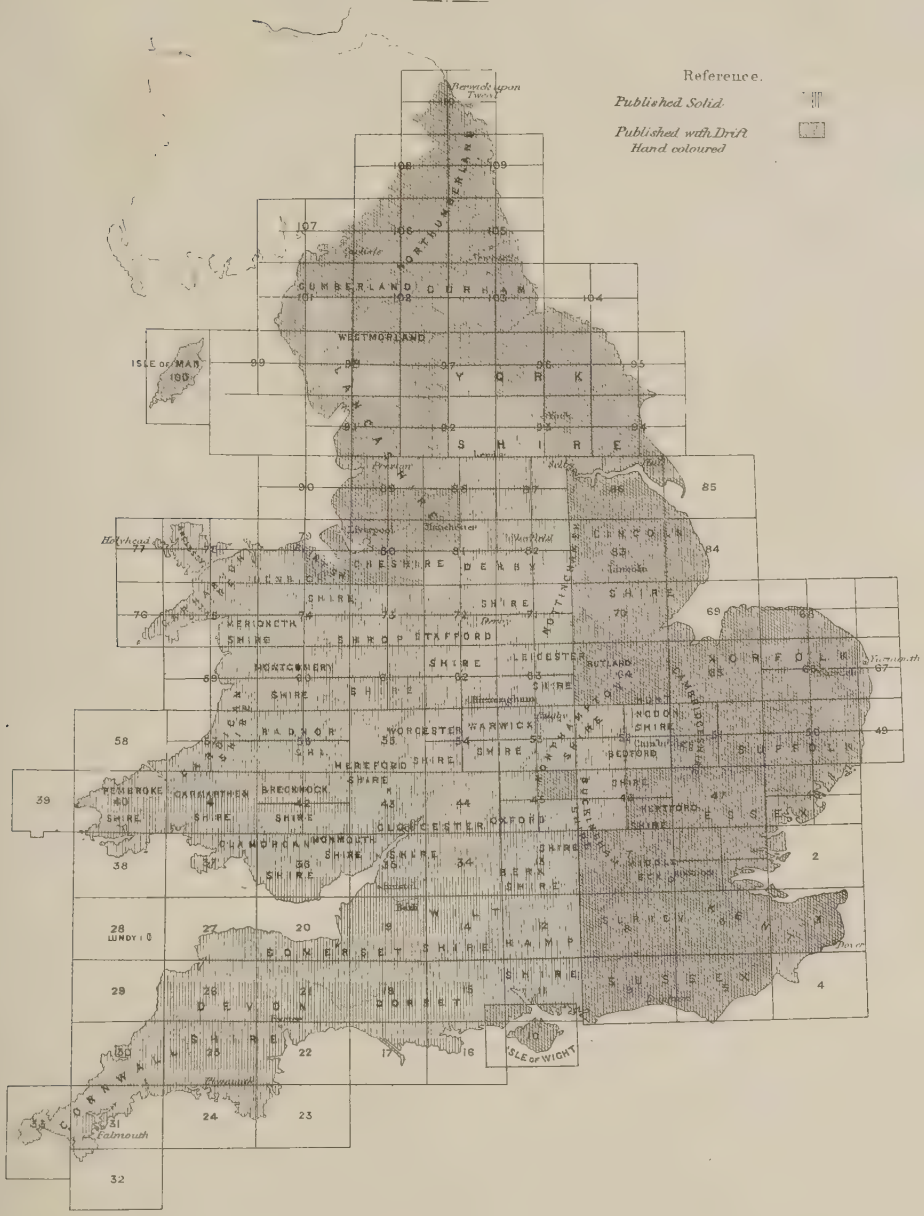

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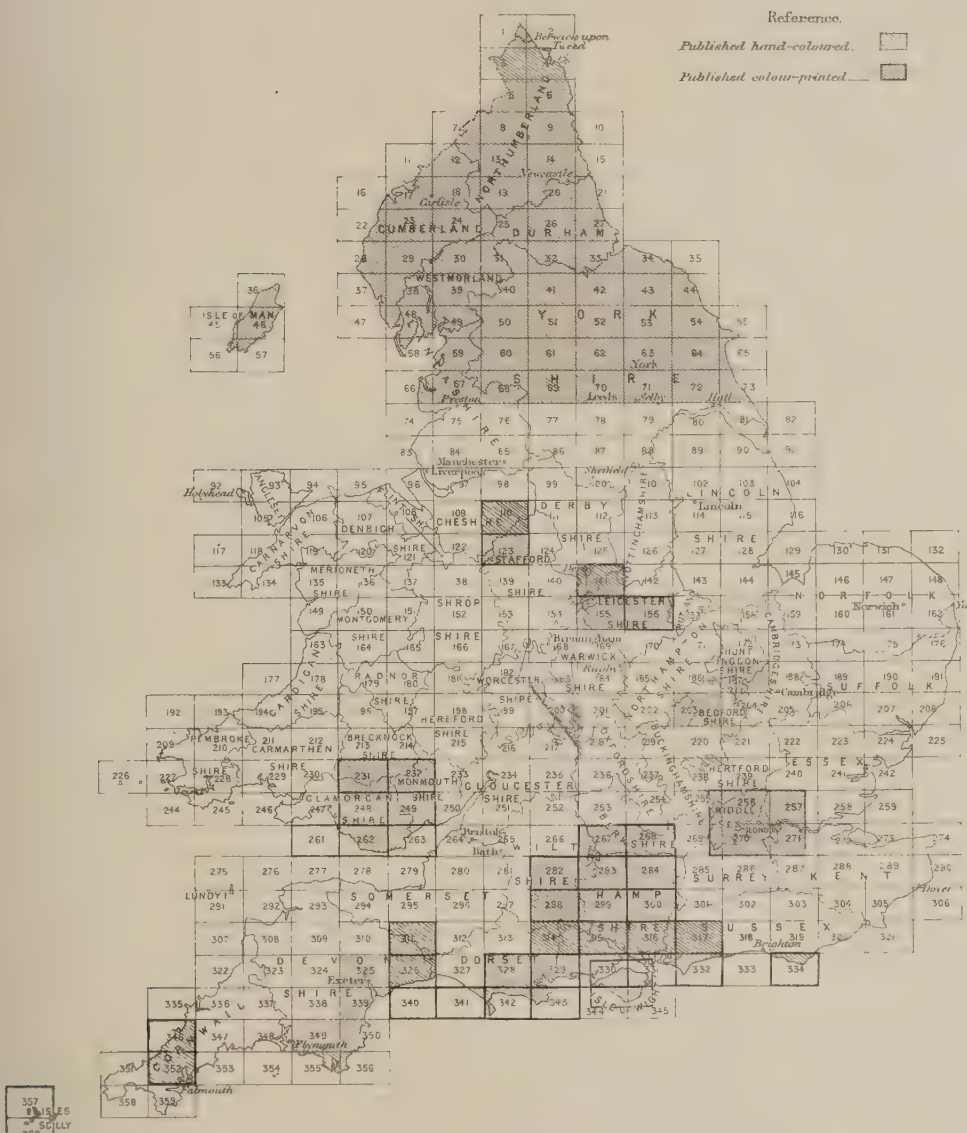

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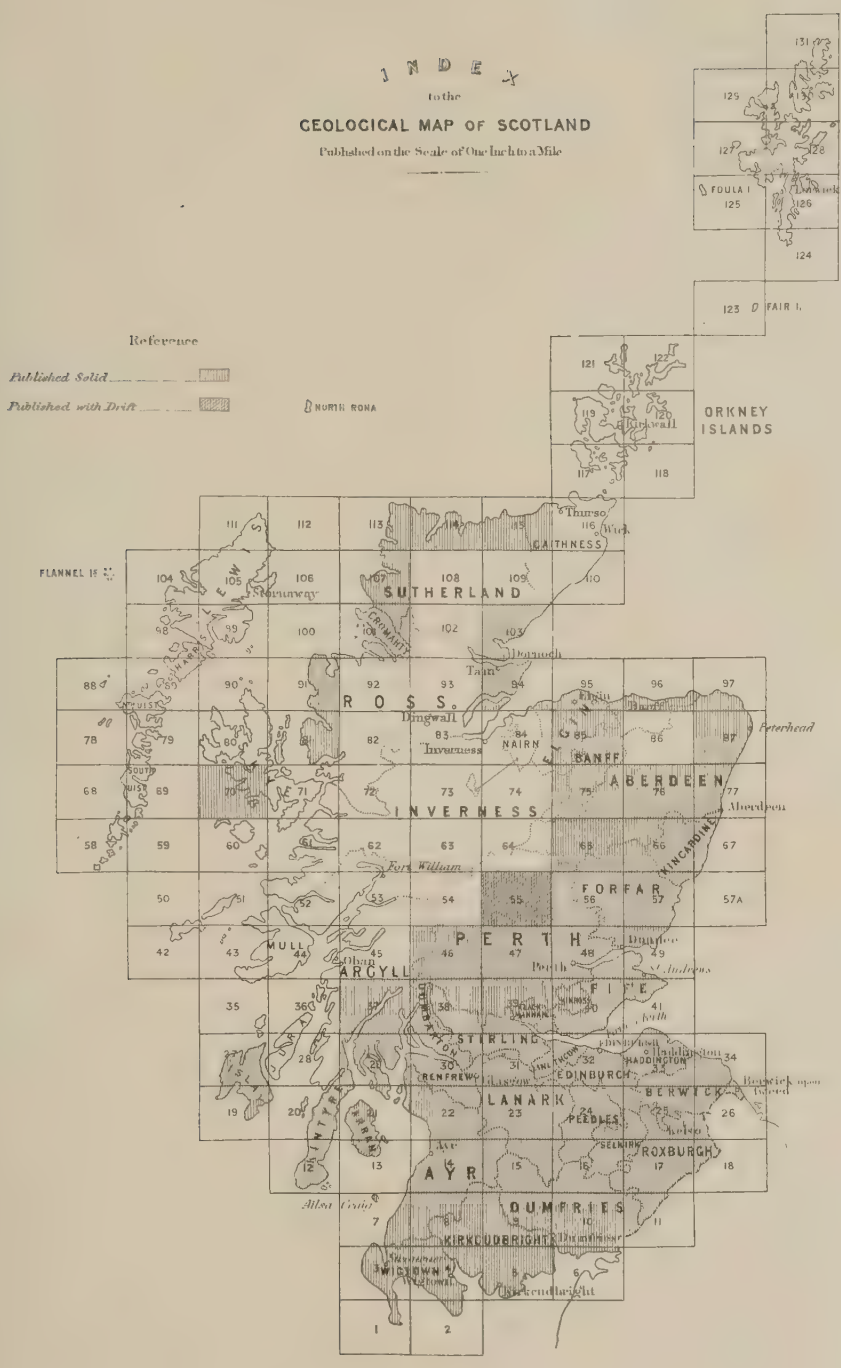
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SOLAR PHYSICS COMMITTEE.

SOLAR PHYSICS COMMITTEE.

SOLAR PHYSICS OBSERVATORY.

I.—Laboratory Work.

(a.) *Rowland Grating.*

No further spectra have been photographed with this instrument during the past year.

(b.) *3-inch Cooke Spectroscope.*

The spectra of the following substances have been photographed with this instrument:—

No.	Substance.	Description.	Region. λλ	Source of Temperature and Conditions.
197	Sodium chloride	—	3600–6000	Two sparks immersed in Bunsen flame.
198	„	—	„ „	„ „ „
199	Vesuvius dust	Collected April 5, 1906	„ „	Arc on Silver Poles.
200	„	Collected April 8, 1906	„ „	„ „ „ „
201	„	Collected April 10, 1906	„ „	„ „ „ „
202	„	Collected April 10, 1906	„ „	„ „ „ „
203	Mineral	From Metallurgical Laboratory, Royal College of Science	„ „	„ „ „ „

The samples of volcanic dust were forwarded to the Observatory by the kindness of Major Davis.

(c.) *Three-prism Laboratory Spectroscope.*

A series of experiments on the spark and flame spectra of Calcium, Magnesium and Sodium has been conducted, in which, by photographing simultaneously the spectra of two induction sparks between platinum terminals, in series, immersed in the outer cone of a Bunsen flame at different levels, and the spectrum of the flame supplied with the various metals, the effect of different initial temperatures of the enveloping gases on the spark was investigated.

In continuation of work carried out on the gases evolved by metals under the influence of the electric spark in vacuo, experiments have been made on the effect of sparking Lead and Magnesium in vacuum tubes connected by glass joints to the pump.

II.—Sun-Spot Spectra.

(a.) *South Kensington.*

Observations of the solar disc have been made whenever the weather permitted and the most widened lines have been observed in the spectra of 225 spots. Excluding Sundays, there were 313 observing days during the year.

The following is a digest of the observatory note-book during this period:—

Month.	No. of Spot-Spectra observed.	Days on which					
		Observations of Spot-Spectra were made.	"No Spots" was recorded.	Spots recorded, but too small for Spectrum Observations.	Spots observed, but Spectra not recorded owing to bad Weather.	Bad Weather entirely prevented Observations.	Assistants were on duty for Observation.
1906.							
Jan. -	10	6	0	0	18	3	27
Feb. -	17	10	0	0	5	9	24
March -	23	13	0	0	10	4	27
April -	32	17	0	0	6	2	25
May -	18	10	0	1	13	3	27
June -	25	14	1	2	6	3	26
July -	44	19	0	0	7	0	26
Aug. -	34	17	0	2	7	1	27
Sept. -	17	12	0	0	11	2	25
Oct. -	0	0	7	12	2	6	27
Nov. -	3	3	0	1	7	15	26
Dec. -	2	1	0	2	11	12	26
Totals	225	122	8	20	103	60	313

The widened lines now recorded are still, in the main, due to Vanadium, Titanium, and unknown elements.

(b.) *Poona.*

Further observations of the widened lines recorded at the Maharajah Takhtasinghi Observatory, Poona, have been received; the dates extend from December, 1905, to November, 1906. During this interval there were 313 days available for observations, but, as the observers attended on eighteen Sundays, this number was raised, despite the frequent occurrence of Government Gazetted Holidays, to 322 days. Out of this number 76 days were unfavourable for any observations, and on 8 days "No Spots" was recorded. Spectroscopic observations were made on 174 days, and 331 spots were examined.

During September, October, and November, 1906, the observations were interrupted by plague rats invading the solar spectroscope room.

The following table gives a digest of the Poona observations for this period :—

Month.	Number of Spot-Spectra observed.	Days on which						Number of week-days available.
		Observations of Spot-Spectra were made.	"No Spots" was recorded.	Spots recorded, but too small for Spectrum Observations.	Spots observed, but Spectra not recorded owing to bad Weather.	Bad Weather entirely prevented Observations.	Observations were made.	
1905.								
Dec. -	46	24	0	0	0	0	24	26
1906.								
Jan. -	38	22	0	0	4	0	26	27
Feb. -	31	22	0	0	1	0	23	24
March -	63	20	0	2	1	3	26	27
April -	45	23	0	2	0	0	25	25
May -	51	24	0	0	2	0	26	27
June -	9	8	0	2	2	16	28	26
July -	0	0	0	0	5	26	31	26
Aug. -	3	3	0	1	8	19	31	27
Sept. -	7	8	0	0	8	10	25	25
Oct. -	0	0	8	0	–	1	28	27
Nov. -	38	20	0	0	2	1	29	26

The Poona observations have, during the past year, agreed still more closely with the results obtained at South Kensington.

The majority of the Poona lines have been recorded at South Kensington. Although the same lines are seen at both observatories, yet the records continue to show minor differences in the arrangement of the lines in order of widening. The disagreement is not more than might be expected to result from the differences in observers and the instrumental and atmospheric conditions of observation.

(c.) *Kodaikanal.*

The first batch of observations of widened lines in sunspot spectra made at the Solar Physics Observatory, Kodaikanal, during the months of July, August, and September, 1906, were received in November. These will be reduced in comparison with the observations made at Poona and South Kensington.

III.—Night Work.

(a.) *30-inch Reflector.*

This instrument is in good working order with the exception of the surfaces of the mirrors, which need resilvering, but the observers were fully occupied owing to the pressure of other work and the silvering has therefore been deferred.

(b.) *6-inch Henry, with two prisms.*

As mentioned in the report for last year, the new mounting for this instrument, embodying various improvements designed to secure the utmost possible rigidity, was finally erected in December last.

Owing to the continued prevalence of adverse atmospheric conditions, the beginning of March was reached before the instrument was satisfactorily focussed. The new mounting has since proved eminently efficient, and the instrument has been in continual employment.

The spectra of the following stars have been photographed:—

Andromedæ	*a*	(five plates)
Aquilæ	*a*	
Aurigæ	*a*	(two plates)
Boötis	*a*	(two plates)
Canis Majoris	*a*	(four plates)
Canis Minoris	*a*	(two plates)
Ceti	*o*	(two plates)
Cygni	*a*	(six plates)
„	γ	

Geminorum	α	
„	β	(two plates)
Lyræ	α	(four plates)
Orionis	β	(five plates)
„	γ	(four plates)
Pegasi	α	
Persei	β	
Tauri	α	(two plates)
Ursæ Majoris	ε	(two plates)
Virginis	α	

Although isochromatic plates have been employed throughout, yet the greatly increased exposure demanded in an attempt to photograph the green region, even in the spectra of the brightest stars, together with the increased dispersion, makes futile any efforts in this direction on any but the clearest nights. During the past year such nights have been rare, so that not much progress has been made in this portion of the programme.

(c.) *9-inch Prismatic Reflector.*

Since the date of the last report, photographs of the spectra of the following stars have been obtained:—

Aurigæ	π	Cephei	η
Can. Venat.	β	Ceti	o
Leonis	λ	Orionis	α
Lyræ	η	„	β
„	θ	Ursæ Majoris	o
Persei	λ	„ „	h

(d.) *6-inch Dallmeyer and Calcite Prismatic Camera.*

Both these instruments, which are on the same mounting, are in good working order, and the spectra of the following stars have been obtained, each pair being on the same plate.

β Aurigæ β Tauri	α Aurigæ β Geminorum
γ Orionis ε Ursæ Majoris	* γ Orionis α Canis Minoris
α Orionis α Canis Minoris	γ Leonis β Leonis
ε Ursæ Majoris η Ursæ Majoris	α Aurigæ α Canis Minoris
α Virginis β Libræ	α Cassiopeiæ α Aurigæ

* Two plates.

At various times the calcite camera exhibited variations of focus which were a source of great inconvenience. During the spring of this year it was found that the brass bands which secure the camera to the cradle of the Dallmeyer had been much corroded at the bends by acid fumes arising from the gas stove. New bands were made to replace these. The instrument was dismounted for further examination, it was then found that the surface of the prism had much deteriorated.

The prism after having been repolished developed flaws, which still remain, but it is hoped they will not seriously impair its future performance.

Whilst the instrument was dismounted the opportunity was taken to have the much worn teeth of the ratchet and clutch of the control recut.

(e.) *36-inch Reflector.*

During the greater part of the year the weather was quite unsuitable for attempting any work on faint spectra. Advantage was taken of this to carry out several improvements which had been desirable for a considerable time. The chief of these was to enable the spectroscope slit to be adjusted directly to the principal focus of the large mirror enabling the subsidiary concave lens formerly employed to be dispensed with. This was done by replacing the three main adjusting screws of the mirror by longer ones, so that the mirror could be raised about $1\frac{1}{2}$ inches from its former position, and also by altering the position of the mirror cover to conform with the new position of the mirror.

The mirror and flat were resilvered by the Improved Electric Glow Company on October 8, and the instrument adjusted for photographing the spectra of nebulæ. The spectra of the following objects have been obtained:—

Orion Nebula.
o Ceti (Mira).
α Orionis.

(f.) *Meteors.*

Unfavourable weather conditions entirely prevented any systematic observations of either of the principal meteor showers in August and November.

(g.) *Distribution of Instruments.*

During this year the instruments have been distributed as follows, the observers for each instrument taking alternate nights.

Instrument.	January—September.	October—December.
36″ reflector.	Dr. W. J. S. Lockyer. Mr. C. P. Butler.	Dr. W. J. S. Lockyer. Mr. C. P. Butler.
6″ Henry prismatic camera.	Mr. F. E. Baxandall, Mr. W. Moss.	Mr. F. E. Baxandall. Mr. W. E. Rolston.
Calcite „ „	Mr. W. E. Rolston. Mr. H. E. Goodson.	Mr. W. Moss. Mr. T. F. Connolly.
9″ Reflecting „ „	Mr. T. F. Connolly.	Mr. H. E. Goodson.

(h.) *Observing Nights.*

The state of the weather for observing purposes, from January to December, 1906, inclusive, is indicated in the following table:—

Month.	No. of Nights available.	No. of Nights Observers attended.	No. of Nights partially bad.	No. of Nights wholly bad.
1906.				
January - -	27	12	8	15
February - -	24	11	8	13
March - - -	27	12	8	15
April - - -	25	13	12	12
May - - -	27	7	6	20
June - - -	26	9	7	17
July - - -	26	8	4	18
August - - -	27	9	5	18
September - -	25	10	6	15
October - -	27	11	7	16
November - -	26	10	7	16
December - -	26	10	6	16
Totals - -	313	122	84	191

Nights designated "partially bad" in the above table are those on which no successful exposures were made.

IV.—Sun Photographs.

A. Photoheliograph.

(a.) *Indian Photographs. 8-inch pictures.*

Since the date of the last report, 487 8-inch negatives, taken during the period October 26, 1905, to November 14, 1906, inclusive, and 58 12-inch negatives have been received from Dehra Dûn.

No photographs could be taken at Dehra Dûn on the following dates, chiefly on account of bad weather; gaps in the Indian record are therefore as follows:—

1906. January 3, 7, 8, 17, 20, 23, 25.
„ February 8, 13, 14, 15, 16, 17, 18, 22.
„ March 8, 10, 13, 19, 21, 23, 24, 26, 31.
„ April 5, 25.
„ May 8, 15.
„ June 22, 23, 24, 25, 26, 27.
„ July 11, 17, 18, 25, 27, 28.
„ August 1, 2, 3, 4, 5, 6, 7, 9, 13, 15, 19, 28.
„ September 1, 4, 5, 7, 8, 12, 13, 14, 15.
„ October. No gaps.
„ November. No gaps.

464 8-inch and 58 12-inch prints have also been forwarded from Dehra Dûn, and have been mounted in the usual manner. The dates of the former extend from November 9, 1905, to November 7, 1906.

(b.) *Mauritius Photographs.*

Since the date of the last report 502 8-inch negatives have been received from Mauritius. 30 of these were taken during 1904, the rest during the period July 1, 1905, to June 30, 1906, and from among them the gaps in the Indian record (mentioned in this and previous reports) have been filled up with the exception of the following:—

1905. July 9.
1906. January 25.
„ February 17.
„ March 8, 10, 13.
„ May 15.
„ July 11, 17, 18, 25, 27, 28.
„ August 1, 2, 3, 4, 5, 6, 7, 9, 13, 15, 19, 28.
„ September 1, 4, 5, 7, 8, 12, 13, 14, 15.

The last batch of negatives was received from Mauritius on December 5, 1906, and as these extend only to June 30, 1906, the above vacant dates in July, August and September may be filled up when the next batch arrives.

As in the previous report, no prints have been received during the past year from Mauritius.

On inquiry it was learned that the preparation of prints from the solar negatives had been discontinued on account of pressure of work. The preservation of the record is ensured by retaining at Mauritius, as far as possible, duplicates of the negatives dispatched to South Kensington.

B. Spectroheliograph.

Since the date of the last report arrangements have been made with the Director-General of Indian Observatories for the exchange of spectroheliograms between the Kodaikanal Observatory and South Kensington. It has been decided that a duplicate "disc" negative will be taken at Kodaikanal as often as possible and these will be forwarded to South Kensington in convenient batches. For those days on which but one negative can be obtained a positive copy on glass will be made and forwarded. In return for these plates, positive-on-glass copies of the best "limb" negatives for each day on which photographs are obtained at South Kensington are being dispatched monthly to Kodaikanal.

The formation of a series of daily spectroheliograms is now in progress and already negatives for the period January to October, 1906, have been received. The method of reduction to be employed on these plates is still under discussion.

To facilitate direct comparison of the spectroheliograph and photoheliograph records of the solar surface, bromide enlargements, 8 inches in diameter, are being made from the small solar discs of the original negatives. It is intended to mount these enlargements side by side with the photoheliograph prints.

The method of gelatine wet mounting, which has never given quite satisfactory results, has now been superseded by a dry mounting process. In this way the troublesome warping of print and mount is obviated, thus reducing the difficulties of subsequent comparison, copying, etc.

(a.) *South Kensington.*

The observing conditions have been fine enough on 162 days to warrant attempts being made to secure photographs with the spectroheliograph during the period January 27 to December 1, 1906.

During the year 390 negatives have been secured showing the distribution of "K" radiation on the sun's disc; of these 282 have been selected for measurement; with the addition of

an occulting disc over the primary slit-plate, 95 negatives were obtained showing the prominences, and on most of these the structure on the disc was also separately photographed.

The 6-inch spectroscope mirror was resilvered on February 29, May 29, and August 16.

The 18-inch siderostat mirror was also resilvered on February 29, May 29, August 16, and again on September 27.

Since the arrangements referred to above came into operation, 58 copies of spectroheliograms showing the sun's limb in "K" light have been forwarded to Kodaikanal. These were taken during the period March 7 to October 29, 1906.

(b.) *Kodaikanal.*

Since the arrangements previously referred to came into operation, 227 plates showing the sun's disc in "K" light have been received from Kodaikanal.

These were taken during the period January 1 to October 31, 1906.

No photographs were taken at either Kodaikanal or South Kensington on the following dates:—

January 5, 6, 16, 17, 18, 21.
February 23, 25.
March 1.
April 22, 26, 29.
May 3, 4.
June 14, 15, 16, 17, 18.
July 15, 21, 22, 30.
August 18, 19, 20, 25, 26.
September 19, 20, 23, 24.
October 18, 19, 21, 22, 26, 28.

In the table which follows, the number of days in each month on which spectroheliograms were obtained at South Kensington and Kodaikanal respectively are compared. In consequence of work being carried out on Sundays at the latter observatory, a column has been added showing the number of spectroheliograms obtained on these extra days.

Month.	South Kensington.	Kodaikanal.	No. of Sundays included in the Kodaikanal record.
1906.			
January - - -	2	25	4
February - - - -	6	25	3
March - -	14	29	3
April - - - -	19	27	5
May - - - -	11	29	4
June - - - -	19	17	3
July - - - -	25	18	2
August - - - -	21	17	2
September - - -	16	21	2
October - - -	13	19	4
November - - -	4	—	—
December - - -	1	—	—
Totals - -	151	227	32

V.—Miscellaneous.

During the year photographs and diagrams have been loaned for exhibition on the following occasions:—

The Royal Society's Conversaziones, May 9 and June 20.
The Royal Photographic Society's Exhibition.
The New Zealand International Exhibition.

Visits were paid to the Observatory by:—

Professor Percival Lowell (Arizona).
Professor M. E. Rogovsky (Kharkov).
Professor E. T. Whittaker (Dublin).
Dr. W. G. Davis (Cordoba).
Dr. J. Halm (Edinburgh).
Dr. Wilhelm Ostwald (Berlin).
Dr. G. T. Walker (Calcutta).
Party of Students from Garden City (Herts.).

VI.—Instruments.

In addition to the instruments mentioned in previous reports, the following are now at the disposal of the Committee:—

1 Adhesive dry-mounting machine.

1 Nernst projection lantern with 1 100-volt lamp and 1 200-volt lamp.

1 ¼-plate focal-plane shutter.

2 Dark slides for use with above.

1 Dallmeyer isochromatic screen.

3 Steel rules 12″, 6″, and 4″.

1 Micrometer scale for measurement of spectroheliograms.

VII.—Papers Published or in Preparation.

(1.) The following papers have been published since the date of the last report:—

"On the Observations of Stars made in some British Stone Circles." Second Note. By Sir Norman Lockyer, K.C.B., F.R.S., LL.D., Sc.D. Communicated March 19. *Proc. Roy. Soc.*, A., Vol. 77, pp. 465–472.

"Some Stars with Peculiar Spectra." By Sir Norman Lockyer, K.C.B., F.R.S., LL.D., Sc.D., and F. E. Baxandall, A.R.C.Sc. Communicated May 5. *Proc. Roy. Soc.*, A., Vol. 77, pp. 550–553.

"Barometric Variations of Long Duration over Large Areas." By William J. S. Lockyer, M.A., Ph.D., F.R.A.S. Communicated by Sir Norman Lockyer, K.C.B., LL.D., Sc.D., F.R.S., May 8. *Proc. Roy. Soc.*, A., Vol. 78, pp. 43–60.

"Tables of Wave-Lengths of Enhanced Lines" compiled from investigations made at the Solar Physics Observatory, South Kensington, under the direction of Sir Norman Lockyer, K.C.B., LL.D., Sc.D., F.R.S. May, 1906. S.P.C. Publication.

(2.) The following papers are ready for publication or in the press:—

"Total Eclipse of the Sun, August 30, 1905. Account of the Observations made by the Solar Physics Observatory Expedition at Palma, Majorca." Communicated to Royal Society, July, 1906.

"A Comparison of Metals present in certain Terrestrial and Celestial Light Sources." Sent to press, December, 1906. S.P.C. Publication.

(3.) The following papers are nearly ready for publication:—

"Discussion of the Widened Lines of Various Elements recorded in the Sun-spot Observations 1879–1903."

"The Spectrum of γ Cassiopeiæ."

"On the Occurrence of Enhanced Lines in Arc Spectra."

"The Relative Temperature of Sirian and Arcturian Stars."

"Unorigined Lines in Celestial Spectra."

"The Spectra of certain Type Stars."

(4) Some of the papers now in hand are as follows:—

"Complete Discussion of the Observations on Nova Persei."

"Sun-spots and Meteorology."

"The Spectrum of P. Cygni."

"The Enhanced Lines of Metals of Low Atomic Weight.'

"Further Observations on the Spectra of Meteorites."

"Observations of β Lyræ."

"The Order of Appearance of Chemical Substances in Nebulæ."

"Solar Prominence Reductions."

"The Short Period Barometric Pressure Variation and its relation to Rainfall."

VIII.—S.P.C.—Publications.

Below is given the list of the publications of the Solar Physics Committee since its appointment in 1879.

Date of Publication or Distribution.	Title.
1880 - - -	"Preliminary Report of the Committee on Solar Physics."
1882 - - -	"Report by the Committee on Solar Physics."
1889 - - -	"Second Report by the Committee on Solar Physics."
March, 1892 -	"Position and Areas of Sun-spots and Faculæ, 1878-1881."
October, 1900 -	"Spectra of Sun-spots, 1879–1897."
May, 1902 -	"Catalogue of 470 of the Brighter Stars."
November, 1902	"Areas of Sun-spots, 1832–1900."
February 13, 1905	"Mean Annual Variations of Barometric Pressure and Rainfall."
May, 1906 - -	"Tables of Wave-lengths of Enhanced Lines."

Besides the foregoing, the following publications have been issued by the Royal Observatory at Greenwich, by arrangement with the Solar Physics Committee:—

Date of Publication or Distribution.	Title.
July, 1889	"Position and Areas of Sun-spots and Faculæ, 1887."*
„ „	" „ „ „ „ 1888.'
June, 1891	" „ „ „ „ 1889."
November, 1892	" „ „ „ „ 1890.
March, 1894	" „ „ „ „ 1891."
„ 1895	" „ „ „ „ 1892."
July, 1896	" „ „ „ „ 1893."
February, 1899	" „ „ „ „ 1894.'
„ „	" „ „ „ „ 1895."
	" „ „ „ „ 1896.'
„ „	" „ „ „ „ 1897."
April, 1901	" „ „ „ „ 1898.'
June, „	" „ „ „ „ 1899"
„ 1904	" „ „ „ 1900."
„ „	" „ „ „ „ 1901."
April, 1905	" „ „ „ 1902."
May, 1906	" „ „ „ „ 1903.
August, 1906	" „ „ „ „ 1904."

* The previous volumes of Positions and Areas of Sun-spots issued by the Greenwich Observatory date from 1874.

IX.—Personnel.

At the end of the period covered by this report the staff was constituted as follows:—

Sir J. Norman Lockyer, Director.
Dr. W. J. S. Lockyer, Chief Assistant.
Mr. F. E. Baxandall, First Assistant.
Mr. C. P. Butler, Second Assistant.
Mr. W. E. Rolston,
Mr. W. Moss,
Mr. T F. Connolly,
Mr. H. E. Goodson,
} Computers.

Mr. J. P. Wilkie is occupied with the photographic reproductions.

Mr. T. Mills, Laboratory Assistant, and Mr. G. Bendall, helped the observers in the night work, and during the day attended to the mounting of the solar photographs, cataloguing of negatives, the cleaning of the various instruments, and the minor repairs necessary from time to time.

X.—Constitution of the Solar Physics Committee.

Sir William de W. Abney, K.C.B., D.C.L., D.Sc., F.R.S.
Sir William H. M. Christie, K.C.B., M.A., D.Sc., F.R.S. (Astronomer Royal).
Sir G. H. Darwin, K.C.B., M.A., F.R.S.
Sir John Eliot, K.C.I.E., M.A., F.R.S.
Mr. J. Larmor, M.A., D.Sc. LL.D., D.C.L., Sec. R.S.
Sir J. Norman Lockyer, K.C.B., LL.D., Sc.D., F.R.S.
Mr. H. F. Newall, M.A., F.R.S.
Mr. F. G. Ogilvie, C.B., M.A., B.Sc.
Mr. W. N. Shaw, M.A., Sc.D., F.R.S.
Lieut-General Sir Richard Strachey, R.E., G.C.S.I., LL.D., F.R.S.

Secretary,—Mr. Frank Rede Fowke

BOARD OF EDUCATION.

REPORT

FOR THE YEAR 1907,

ON

THE VICTORIA AND ALBERT MUSEUM,

THE ROYAL COLLEGES OF SCIENCE AND OF ART,

THE GEOLOGICAL SURVEY AND MUSEUM,

AND ON THE WORK OF

THE SOLAR PHYSICS COMMITTEE.

Presented to both Houses of Parliament by Command of His Majesty.

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1908.

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THE VICTORIA AND ALBERT MUSEUM.

PREFATORY NOTE.

This Volume contains Reports taken from the official records of the Victoria and Albert Museum, the Royal Colleges of Science and of Art, the Geological Survey and Museum, and the Solar Physics Committee.

The Reports on the Museums, the Geological Survey, and the Solar Physics Committee deal with the work of those Institutions during the year 1907, and the Reports on the Royal Colleges deal with the work of the Session 1906-1907.

December, 1908.

Robert L. Morant

10490. 75.—Wt. 2155. 12/08. Wy. & S. 7031r.

THE VICTORIA AND ALBERT MUSEUM.

REPORT AND RETURNS FOR THE YEAR 1907.

THE ART MUSEUM.

The number of objects acquired for the Art Museum by purchase, gift or bequest was 988. The following list gives the principal acquisitions made in the various sections during the year 1907, and also the chief loans for the same period.

I.—Sculpture.

	£	s.	d.
By purchase :—			
Two carved stone chimney-pieces. English, about 1600	100	0	0
Small collection of Græco-Buddhist sculptures of the 3rd and 4th centuries, carved in talcose-schist. Found in the Sivat district, north of the Gandhâra (Yusafzai) district, North Punjab Frontier	80	0	0
Pair of marble brackets, partly gilt, from the Abbey of Tongerloo. Flemish, about 1538	38	11	9
Alabaster relief. The Trinity with angels. English (Nottingham school), 15th century	17	0	0
By gift :—			
Objects of ancient Egyptian workmanship from Rifa and Gîza, including a series of alabaster perfume-vases (6th to 18th dynasty) and an ivory carving of the 1st dynasty ; given by the British School of Archæology in Egypt.			
Twenty-seven netsukes, mostly in ivory and wood. Japanese, 18th and 19th centuries ; bequeathed by R. T. Pritchett, Esq.			
A tall cup, carved from a rhinoceros horn, with stand of carved wood. Chinese, 18th century ; bequeathed by Miss E. B. Dent.			

The following were the principal loans to this section during the year :—

A syrinx of carved soapstone, found in a tomb in Peru ; lent by Canon J. H. Rawdon.
Additions to the collection of Mediæval ivories ; lent by J. Pierpont Morgan, Esq.

II—Textile Fabrics, Embroideries, and Lace.

	£	s.	d.
By purchase :—			
Eleven silk textiles. Persian 16th to 18th centuries	150	0	0

	£	s.	d.
Chasuble of Florentine crimson velvet brocade of the middle of the 15th century, with English embroidered orphreys bearing the arms of Henry de Beauchamp, Duke of Warwick (d. 1445) after his marriage with Lady Cecily Nevill in 1434	103	12	6
Collection of textiles. Chiefly Italian and Spanish, 15th and 16th centuries	100	0	0
Two silk brocades of the 16th century, one said to have come from a mosque at Bitlis, Armenia, and a Persian embroidered cover of the 18th century	79	10	5
Set of embroidered bed-hangings. English, about 1700	70	0	0
Humeral veil of embroidered velvet. Spanish, 16th century	53	8	7
Woollen pile carpet. Spanish, 16th century	53	8	7
Bed-curtain of embroidered linen. Rhodian, 17th or 18th century	50	0	0
Dalmatic of silk brocade. Persian, late 17th or early 18th century	50	0	0
Collection of costumes and embroidery. Russian, 18th and 19th centuries	40	0	0
Two fragments of velvet brocade. Italian (Venetian); late 15th century	28	17	8
General's uniform of silk brocade, with metal helmet and ornaments. Chinese (Manchu), 19th century	25	0	0

By gift :—

Two flounces of pillow-made lace. North Italian and Brussels, 17th and early 18th centuries; bequeathed by the late Mrs. Lewis-Hill.

Hanging of embroidered satin. Roumanian, second half of 19th century; given by the Hon. Sir William Barrington, K.C.M.G.

The following were the principal loans to this section during the year:—

A shawl of pillow-made appliqué lace. Brussels, first half of 19th century; lent by Mrs. Brooman White.

A tabard, embroidered with the arms of the Stuart Kings, probably for Lyon King-at-Arms. Scottish, 17th century; lent by Alfred Williams Hearn, Esq.

III.—Woodwork, Furniture, Musical Instruments and Leatherwork.

By purchase :—

	£	s.	d.
Two panelled rooms from the Casa Mattei at Osogna (Switzerland); date 1617	804	4	4
Twenty-two pieces of English furniture, chiefly 18th century, formerly belonging to the Massey-Mainwaring estate	327	10	0
Twenty pieces of English furniture, chiefly 17th century	140	16	7
Oak cupboard. Dutch, first half of 17th century	74	1	4
Group: the Marriage of the Virgin; walnut, painted and gilt. German (Lower Rhenish or Westphalian), about 1500	67	12	3

	£	*s.*	*d.*
Barometer, in mahogany case. Style of Chippendale. English, middle of 18th century - -	48	10	0
Lacquered cabinet. Japanese, 18th century -	40	0	0
Coffer, with marquetry of various woods. Swiss, late 16th or early 17th century - - -	39	11	2
Bedstead of carved, inlaid, and lacquered wood. Chinese; probably 18th century - - -	30	0	0
Oak credence. English, early 17th century - -	30	0	0
Six portions of carved and painted frieze. Hispano-Moresque, 14th or 15th century - -	29	8	0
Two beams of carved, painted and gilt wood. Chinese, Ch'ien Lung period (1736-1795) - -	25	0	0
Walnut spinet with oak stand. By Joseph Mahoon, London. Late 17th or early 18th century - - - - - - - -	25	0	0
Bagpipes. French, period of Louis XVI. - -	25	0	0

By gift:—

Six Japanese netsukes and various other small objects; given by Alfred Tyson, Esq.

Sedan chair. English, late 18th century; given by Mrs. Hind Smith.

Chess table and chessmen, of wood and ivory. Taken from the Royal Palace at Merkara, Coorg, in 1832. Southern Indian, 18th century; given by Mrs. F. Halse.

Grand piano, made at Vienna, and upright harp-shaped piano, made at Amsterdam, in the Empire style. Early 19th century; given by Sir W. Q. Orchardson, R.A.

Fifteen specimens of woodcarving and eleven bookbindings; given by Sydney Vacher, Esq.

Two bowls of carved red lacquer. Chinese (Soochow); bequeathed by the late Miss E. B. Dent.

Two examples of woodcarving (Egyptian, 11th dynasty), and three of painted and otherwise decorated linen (18th dynasty); from Mentu hetep's Temple at Deir-el-Bahri; given by the Egypt Exploration Fund.

The following were the principal loans to this section during the year:—

Collection of carved red lacquer. Chinese (Soochow); lent by Mrs. J. P. Bland.

Five-fold screen of carved wood. Burmese; lent by Mrs. Horsford.

Additions to the collections lent by George Salting, Esq.

Additions to the collections lent by J. H. Fitzhenry, Esq.

Burmese furniture and lacquered ware, of the 18th and 19th century; lent by L. M. Parlett, Esq.

IV.—Keramics, Glass and Enamels.

By purchase:—

A collection of lustred enamelled earthenware. Hispano-Moresque (Valencia), 15th to 17th centuries - - - - - - - - -	3,000	0	0
Fourteen panels of stained glass. Swiss and German, 16th and 17th centuries; formerly belonging to the Massey-Mainwaring estate -	200	0	0

	£	s.	d.
A lustred earthenware bowl from Sultanabad. Persian, 13th century	72	0	0
An incense-burner and two beakers of cloisonné enamel. Chinese, 18th century; formerly belonging to the Massey-Mainwaring estate	60	0	0
A collection of pottery and tiles found at Sultanabad. Persian, 13th century	58	0	0

By gift :—

A collection of porcelain illustrating the styles of decoration of the Yung-chêng period. Chinese; given by Mrs. W. G. Gulland.

A collection of blue and white porcelain, chiefly of the K'ang Hsi period (1662–1722). Chinese; given by Andrew Burman, Esq.

A Chinese porcelain dish of the Yung-chêng period and a set of four vases of Worcester porcelain, 18th century; bequeathed by Henry Couling, Esq.

A pair of enamelled brass stirrup-irons. English, 17th century; given by J. H. Fitzhenry, Esq.

The following were the principal loans to this section during the year :—

Additions to his collection; lent by George Salting, Esq.

Additions to his collection; lent by J. H. Fitzhenry, Esq.

A Hispano-Moresque ewer of the second half of the 15th century; lent by Col. W. F. Tipping.

V.—Metal Work, Coins and Medals, Arms and Armour, Silversmiths' Work, Jewellery and Goldsmiths' Work.

By purchase :—

	£	s.	d.
Pierced silver clock-watch by Edward East, 17th century	70	0	0
Badge of a Guild of St. George, silver-gilt, enamelled. German, dated 1528	175	0	0
Silver parcel-gilt cup. French, 16th century	47	0	0
Processional cross of silver with enamelled medallions. Italian, early 14th century	49	13	3
A silver-gilt double cup, decorated in repoussé, made by Jeronymus Behaim. German (Nuremberg), about 1600	244	1	3
A silver-gilt cup with etched ornament, made by Hans Beutmüller. German (Nuremberg), late 16th century	80	0	0
Brass chandelier from the Nieuwekerk, Amsterdam. Dutch, early 18th century	197	18	10
Collection of brass bowls and salvers. Chiefly German, first half of 16th century	175	0	0
Tray of brass damascened with silver. Probably from the neighbourhood of Bokhara	40	0	0
Candlestick of brass damascened with silver. Saracenic, 14th century	40	0	0
Jewel casket with gilt metal mounts. German (Angsburg), 16th century	66	11	3
Candlestick of brass damascened with silver. Saracenic, 14th century	55	0	0

By gift :— £ *s. d.*

Six silver spoons and toddy-ladles of Scottish make, early 19th century; given by the Marquis of Breadalbane, K.G.

A silver-gilt chalice, engraved and enamelled. Dutch (Zwolle ?), dated 1524; given by J. B. Carrington, Esq.

A collection of Japanese arms, etc.; given by A. Tyson, Esq.

The following were the principal loans to this section during the year :—

Additions to his collection of silver; lent by J. H. Fitzhenry, Esq.

A silver Communion cup of the year 1646–7; lent by the Vicar and Churchwardens of North Ockendon, Essex.

An emerald bow ring and emerald cup on jewelled gold foot, probably made for the Emperor Shah Jahan. Mogul (Delhi) work of the 17th century; lent by W. H. Broun, Esq.

VI.—Paintings.

Four paintings in oil and two in water-colours were received by gift during the year, and twenty-three water-colour paintings (including eight miniatures) were purchased. The chief acquisitions were water-colour paintings by Thomas Rowlandson, John Downman, A.R.A., John Ruskin, Cecil Lawson, and William Callow, R.W.S., and miniatures by Christian Richter, George Engleheart, John Smart, and Mrs. Mee.

VII.—Reproductions.

The reproductions in metal acquired in 1907, consist of a silver-gilt ewer and salver repoussé and chased, English, London hall-mark for 1611, the property of Lord Petre; 25 plaquettes by Peter Flötner (*d.* 1546), in continuation of the collection previously purchased, and five pieces of the Hildesheim Treasure.

The reproductions in plaster acquired during the year include — five Byzantine panels and screens, and a capital, from Ravenna; three examples of architectural ornament excavated in Asia Minor, from paper-moulds given by Miss G. Bell; and a carved wood doorway and pillar from the church at Urnes in Western Norway.

THE ART LIBRARY.

The following list gives the principal acquisitions made in the various sections during the year 1907 :—

I.—Books.

By purchase :—

Manuscript. [Catalogue of the art collections of King Charles I. at Whitehall and St. James's Palace.] Fol. 1640–41.

Manuscript. London: Associated Artists in Water-Colours. [Rough minute book of proceedings at first 6 meetings, 1807; draft resolutions, and agreement to same; letters fron exhibitors, other correspondence, etc.] (13 × 8). 1807–11.

Adelphus (J., pseud. for J. A. Muelich). Barbarossa. 23 cuts. Fol. Strassburg, 1535.

Danieli (B.). Vari disegni di merletti. 2 pp. 13 etchings incl. title. Obl. fol. Bologna, 1641.

Gallery of Fashion, April 1794—March 1795. 54 pp. 24 col. engr. (11 × 9). (London, 1794-95.)

Parkinson (J.). Paradisi in sole paradisus terrestris. Or a choise garden of all sorts of rarest flowers. . . . The second impression. Cuts. Fol. London, 1656.

Vinciolo (F. di). Les singuliers et nouveaux pourtraicts . . . pour toutes sortes d'ouvrages de lingerie. . . . Pour la quatriesme fois augmentez. 113 cuts incl. 5 borders and vignettes. 4 to. Thurin, 1589.

Briquet (C.M.). Les filigranes: dictionnaire historique des marques du papier dès leur apparition vers 1282 jusqu'en 1600. Process illus. 4 vols. (13 × 10). Genève, 1907.

Cipolla (C.). Codici bobbiesi della Biblioteca Universitaria di Torino. 90 phototype plates. 1 vol. and atlas. (19 × 14). Milano, 1907.

Cumberland and Westmorland Antiquarian and Archæological Society. Transactions, I–XVI. Illus. (9 × 5). Kendal, 1874–1900.

Fouquier (M.). Les grands châteaux de France. 1 phototype plate, process illus., and map. 2 vols. (16 × 12). Paris, 1907.

Laking (G. F.). Sèvres porcelain of Buckingham Palace and Windsor Castle. 63 plates (chromo), and 1 phototype. (13 × 11). London, 1907.

Mauclair (C.). Jean-Baptiste Greuze. Introduction de H. Marcel. [Catalogue raisonné . . . par J. Martin et C. Masson.] 60 (4 chromo) plates (16 × 12). Paris (1907).

Nogara (B.). Le nozze Aldobrandine, i paesaggi con scene dell'Odissea e le altre pitture murali antiche conservate nella Biblioteca e nei Musei Pontefici. 54 (8 chromo-) plates, and process illus. (21 × 15). Roma, 1907.

Nolhac (P. de). François Boucher, premier peintre du roi, 1703–1770. 60 (4 chromo) photo-engr. (13 × 10). Paris, 1907.

Poitiers: Société des Antiquaires de l'Ouest. Mémoires. Illus. 50 vols. (10 × 6). Poitiers, 1835–1903.

Tokyo: Imperial Museum. Photographs of palace buildings of Peking, . . . taken by K. Ogawa, with explanatory notes in Japanese by C. Ito, English by T. Tomiogi. 90 pp. 172 collotype plates. 2 vols. (15 × 20). Tokyo, 1906.

Vienna: Kais. Akademie der Wissenschaften. Musil (A.). Kusejr 'Amra. 41 (36 chromo, 5 tinted) plates, process illus. and map. 2 vols. (17 × 13). Wien, 1907.

Vinci (Leonardo da). Problèmes de géométrie et d'hydraulique. . . . Reproduits d'après les originaux conservés à la "Forster Library." 18 pp. 111 facsimiles. 3 vols. (10 × 7). Paris, 1901.

And the commencing parts of the following important works:

Bode (W.), and Marks (M.). The Italian bronze statuettes of the Renaissance. Phototypes and process illus. (19 × 16). London 1907 et seq.

Gurlitt (C.). Die Baukunst Constantinopels. Phototype plates. (21 × 14). Berlin, 1907 et seq.

Hortulus Animæ, Imp. and Roy. Court Library, Vienna. . . . Published, with elucidations referring to the history of art, under the direction of F. Dörnhöffer. Phototypes (some chromo). (15 × 11). Utrecht, 1907 et seq.

Meuble (Le) à l'époque Louis XVI, d'après l'œuvre gravé des principaux maîtres, De la Fosse, Ranson, Liard, etc. [Text from a work by Roubo.] Photo-engr. (18 × 13). Paris (1907 et seq.).

Rivoli (V. Masséna, Duke o R., Prince of Essling). Etudes sur l'art de la gravure sur bois à Venise. Les livres à figures vénitiens de la fin du XV^e^ siècle et du commencement du XVI^e^. Phototypes (some chromo) and process illus. (16×12). Paris, 1907 et seq.

Thieme (U.) and Becker (F.). Allgemeines Lexikon der bildenden Künstler von der Antike bis zur Gegenwart. (11×8). Leipzig, 1907 et seq.

By gift:—

Cosma (M.). Album de brodării si tesături românesti. 17 chromo-lithogr. and 4 phototypes. (14×9). Sibiiu (1907). Given by Frau Minerva Cosma.

Dobson (A.). William Hogarth. New and enlarged ed. 1 photo-engr., and process illus. (9×6). London, 1907. Given by Austin Dobson, Esq.

Ellis (H. D.). A short description of the ancient silver plate belonging to the Worshipful Company of Clothworkers [and to the Worshipful Company of Merchant Taylors]. 5 photogr. and facsimiles of marks. 2 vols. (9×7). London (privately printed), 1891–92. Given by H. D. Ellis, Esq.

Froehner (W.) Collection de la Comtesse R. de Béarn. Plates (some chromo). (13×10). Paris, 1906 et seq. Given by the Countess R. de Béarn.

Hamel (M.). Corot et son œuvre. 48 pp. 101 (1 photo-engr.) plates. 2 vols. (14×11). Paris, 1905. Given by Sir E. Durning-Lawrence, Bart.

Hearn (Mrs. G. A.). Collection of watches loaned to the Metropolitan Museum of Art, . . . New York, by Mrs. G. A. H. 42 pp. 10 photo-engr. (10×7). (Privately printed) 1907. Given by Mr. and Mrs. G. A. Hearn.

Jones (E. A.). Catalogue of the collection of old plate of Leopold de Rothschild, Esq. 41 photo-engr. (13×10). London, 1907. Given by L. de Rothschild, Esq., C.V.O.

Kann (R.). Catalogue of the Rodolphe Kann collection. Photo-engr. 4 vols. (18×14). Paris, 1907. Given by Messrs. Duveen Bros.

Kingdon (J. A.). Richard Grafton, . . . printer to Edward, Prince and King. Illus. incl. facsimiles of documents. Fol. London (privately printed), 1901. Given by Miss Courtenay.

Leete (J.). The family of Leete. By J. L., in conjunction with J. Corbet Anderson (from materials collected by C. Bridger). 2 ed. Plates, and illus. in text. (11×8). London (privately printed), 1906. Given by Joseph Leete, Esq.

Little Rock: Arkansas Historical Association. Publications. Vol. I. Plates, and illus. in text. (9×6). Fayetteville, 1906. Given by H. L. Stoddard, Esq.

London: Worshipful Company of Fishmongers. A short account of portraits, pictures, plate, etc., in the possession of the Company. By J. Wrench Towse, Clerk to the Company. 16 plates. (10×8). London (privately printed), 1907. Given by the Clerk to the Company.

Marquet de Vasselot (J.J.). Catalogue raisonné de la collection Martin Le Roy. [By J. J. M. de V., R. Kœchlin, G. Migeon and L. Metman.] Vols. 1–3. 105 photo-engr. (17×12). Paris, 1906–07. Given by M. Martin Le Roy.

Mikes Zagoni (K.). Letters from Turkey. (In Hungarian). Process illus., incl. 39 (36 chromo) plates from sketches by A. Illés Edvi. (14×9). Budapest, 1906. Given by the Franklin Társulat, Budapest.

Osma (G. J. de). Apuntes sobre cerámica morisca. Textos y documentos valencianos. I. La loza dorada de Manises in el año 1454. 76 pp. 5 process illus. (12×9). Madrid, 1906. Given by Señor D. G. J. de Osma.

Paris. Musée Guimet. Annales du Musée Guimet : bibliothèque d'art. [Second series.] I. II. Phototypes and process illus. (11 × 13) and (13 × 10). Paris (1905), 1883. Given by Monsieur E. Guimet.

Siena. Statuti senesi, . . . pubblicati . . . per cura di F. L. Polidori (and L. Banchi). 3 vols. (9 × 6) Bologna, 1863–77. Given by J. H. Fitzhenry, Esq.

Spielmann (M. H.). The portraits of Shakespeare. 28 pp. 8 photo-engr. 4 to. Stratford-on-Avon (privately printed), 1906–07. Given by M. H. Spielmann, Esq.

Stein (M.A.). Ancient Khotan : detailed report of archæological investigations in Chinese Turkestan. . . . With descriptive list of antiques by F. H. Andrews, and appendices by S. W. Bushell, . . . A. H. Church, . . . E. J. Rapson, etc., 153 (many chromo) plates, 7 illus. in text, and map. 2 vols. (13 × 10). Oxford, 1907. Given by the India Office.

Thompson (H. Yates). A descriptive catalogue of twenty illuminated manuscripts, nos. 75 to 94, . . . in the collection of H. Y. T. [By H. Y. T., M. R. James and S. C. Cockerell.] (11 × 7). Cambridge (privately printed), 1907. Given by H. Yates Thompson, Esq.

Williamson (G. C.). Catalogue of the collection of miniatures, the property of J. Pierpont Morgan. Photo-engr. (many col.), and facsimiles of documents. (15 × 10). London, privately printed, 1906 et seq. Presented by J. Pierpont Morgan, Esq.

II.—Prints and Drawings.

By purchase :—

Engraved designs (24) of chalices, cups, tankards, etc., by Paul Flindt. (£50 was contributed towards the purchase of these prints by the National Art Collections Fund.)

Engraved designs for ornament by J. F. S. Bailly, J. J. Baumgartner, J. Caillart, J. Clark, A. Collaert, H. Collaert, T. De Bry, J. C. Delafosse, S. Gribelin, J. Hauer, J. G. Hertel, D. Hopfer, J. Jores, J. M. Leuchte, the Master of 1551, D. Meyer, D. Mignot, G. M. Preisler, J. D. Preisler, J. G. Ringlin, P. Symony, Virgil Solis, B. Zahn, etc.

Etched designs (26) by J. F. Bracquemond, for the decoration of a dinner service.

Colour Etchings by Ch. Cottet, E. Dauphin, A. Lafitte, G. de Latenay, F. Legout-Gérard, H. Meunier, M. Robbe, and F. Simon.

Water-colour and pencil drawings (52) of Turkish, Persian and other costume, by A. Preziosi, E. Heaphy, etc.

Water colour and pen drawings (52) of South Indian cotton designs.

Japanese drawings (213) of flowers, plants, birds, etc.

Water-colour and pen drawings (7) for illustrations to "The Bluebeard Picture Book," 1874–5, by Walter Crane, R.W.S.

Sketch-book containing 14 sheets of water-colour sketches, with MS. notes, by William Fleetwood Varley.

Water-colour and pencil studies (43) of boats, fish-baskets, lobster-pots, etc., by E. W. Cooke, etc.

Designs (153) in pen, pencil and wash, of ornament for china-ware, plates, dishes, etc.

Water-colour tracings and drawings (162) of stained glass, stone-work, etc., in churches in Norfolk, Suffolk, etc., by H. Watling.

Sketch-book containing 26 sheets of black and white sketches by Peter de Wint.

Portraits (4) in pencil and sketch-books (7) containing 582 sheets of studies for paintings, miniatures, etc., by Samuel Shelley.

Water-colour and pencil studies (3), by James Ward, R.A.
Water-colour designs (10) for Fulham pottery ware, by J. P. Seddon.
Drawings and tracings (291) of architecture, metal-work, stained glass, etc., by J. P. Seddon.
Drawings (107), chiefly studies of the figure, in red chalk, by Alfred Stevens.
Pen and wash drawings (17) for chimney-pieces and monuments (18th cent.), by James Paine, jun.
Pen drawings (12) of ornament for the Kelmscott Press, by William Morris.

By gift :—

Etchings (3) by the donor. Given by J. R. G. Exley, Esq., A.R.E.
Etchings (2), "Cheyne Walk in 1817" and "The Outer Court of Clifford's Inn," by the donor. Given by W. W. Burgess Esq., R.E.
Etching, Certificate of the "London Shipping Federation," by the donor. Given by F. Brangwyn, Esq., A.R.A., R.E.
Etchings (3) by the donor. Given by M. Osborne, Esq., A.R.E.
Mezzotints (10) from the unpublished plates of Turner's "Liber Studiorum." Given by C. M. W. Turner, Esq.
Etched state of the mezzotint, "Crowhurst, Sussex," by the donor, after J. M. W. Turner, R.A. Given by Frank Short, Esq., A.R.A., R.E.
Engraving by J. von. Keller, of Raphael's "Sistine Madonna." Bequeathed by Miss E. B. Dent.
Mezzotint by W. Say, of Sir T. Lawrence's picture of Mrs. Siddons. Bequeathed by Miss F. J. Young.
Pen drawing, "London's Opportunity," by Louis Weirter. Given by the Managing Editor of "The Tribune."
Water-colour drawings by Frank Dicksee, R.A.—"Breaking through" (1872) and "The Banker's Daughter." Bequeathed by W. H. Combes, Esq.
Measured drawings of architecture and original designs :—
81 Drawings or sets of Drawings (described in detail on pp. 34–38) have been received from the Committee of the "Phené Spiers Collection of Drawings of Architecture."

III.—Photographs.

By purchase :—

Photographs (108) of art objects in the Birmingham Museum.
Photographs (391) of art objects exhibited at the exhibitions at Chieti and Macerata.
Photographs (165) of art objects at Cividale del Friuli.
Photographs (376) of art objects in the Museum of the Hôtel de Cluny, Paris.
Photographs (83) of bench ends, etc., in churches in Cornwall.
Photographs (68) of drawings, by Clouet and his school, in the Louvre and the Bibliothèque Nationale, Paris, and at Chantilly.
Photographs (87) of drawings in the Albertina, Vienna, and in other collections.
Photographs (112) of Dutch and Flemish drawings in the print-room of the State Museum at Amsterdam.
Photographs (45) of Swiss drawings : "Handzeichnungen Schweizerischer Meister."
Photographs (26) of drawings for wood engravings.
Photographs (32) of drawings, published by the Vasari Society.
Photographs (56) of engraved ornament by Etienne Delaune.
Photographs (60) of Flemish furniture : "Meubles flamands."
Photographs (42) of French cathedrals and churches.

Photographs (70) of paintings: "Denkmäler der Malerei des Altertums."
Photographs (46) of paintings at Frankfort-on-the-Main.
Photographs (22) of paintings at Leipzig.
Photographs (30) of Flemish paintings in various collections.
Photographs (41) of paintings in the Grand Ducal Gallery at Oldenburg.
Photographs (16) of rood screens in Devonshire churches.
Photographs (24) of Egyptian Sculpture: "Denkmäler Ägyptischer Sculptur."
Photographs (10) of Greek and Roman sculpture: "Griechische und Römische Porträts."

By gift:—

Photographs (161) of Byzantine churches and other buildings in Cilicia and Lycaonia. Given by Miss Gertrude Lowthian Bell.
Photographs (189) of art objects in the Archiepiscopal Palace at Prague, Bohemia. Given by Herr Langhans.

Museum Publications:—

The following new publications were issued, viz.:—

A series of 12 Delft Plates illustrating the Tobacco Industry

List of English Ecclesiastical Embroideries.

Catalogue of a Collection of Eastern Art Objects lent by Lord Curzon of Kedleston, G.C.S.I., G.C.I.E., P.C.

Catalogue of Japanese Colour Prints by M. Tokoyuni in the Art Library.

Japanese Educational Exhibition—Notes on the organisation of Japanese education.

Topographical Index to Measured Drawings of Architecture.

A new edition of the Catalogue of the National Gallery of British Art, Part I., Oil Paintings, has been issued, and the following Handbooks have been reprinted.

Ironwork, Part I., from the earliest times to the end of the mediæval period (2nd edition), by J. Starkie Gardner.

Chinese Art, Part I., by Dr. Stephen W. Bushell, C.M.G.

Ancient and Modern Ships, Part I., Wooden Sailing Ships, by Sir George C. V. Holmes, K.C.V.O., C.B.

CIRCULATION.

The number of Museums receiving loans from the Board during the year was 93, including the Royal Scottish Museum, Edinburgh, and the Museum of Science and Art, Dublin.

The historical collections of water-colour paintings of the British School were exhibited at Bolton, Bootle, Bradford, Burnley, Dundee, Keswick, Leek, Newcastle-on-Tyne, Nottingham, Reading, Rotherham, Sunderland, and Wolverhampton.

The collection of water-colour paintings of Pompeii was lent to Bradford, Bristol, and Keswick.

The collection of embroideries was exhibited at Hull and Sunderland.

The collection of tools and materials used in etching and engraving was lent to Bradford and Newcastle-on-Tyne.

Collections of autotypes of paintings in the National Gallery were lent to Bootle, Oldham, Rochdale, and Sunderland.

A set of chromolithographs of drawings of old English mansions by J. Nash was lent to Reading.

The collection of drawings of Old London was lent to Camberwell.

An historical collection of Illuminated Manuscripts was formed for the Circulation Division, and exhibited at Dundee.

A selection of the works which gained awards in the National Art Competition was exhibited at Bolton, Dublin, Ipswich, and Leeds.

The Board lent collections to 28 temporary exhibitions, the more important of which were:—

Dublin, International Exhibition; Lincoln, an Arts and Crafts Exhibition; Manchester, an Exhibition of English Furniture; Swansea, in connection with the National Eisteddfod of Wales; and Whitechapel, "Animals in Art."

A small collection of Drawings, Photographs, and other reproductions of works of Industrial Art was lent to Bloemfontein; two objects were lent to the "Toison d'Or" Exhibition at Bruges; a small collection of etchings by J. M. Whistler was lent to Mannheim, and a few oil paintings to Toronto.

The visits of Curators and Masters to the Circulation Division for advice as to loans and grants numbered 235.

The number of objects on loan at Museums during the year was 23,767.

The number of objects lent to Exhibitions was 2,833.

The number of objects on loan at Schools and Classes was 24,245.

The number of lantern slides and objects lent for lecture purposes amounted to 3,658.

The total number of works of art on loan during the year was 54,503.

The details of the grants-in-aid towards the purchase of works of art and science objects, amounting to £1,396 6s. 4d., will be found on page 51.

THE SCIENCE MUSEUM.

SCIENCE COLLECTIONS.

MACHINERY AND INVENTIONS DIVISION.

During the year 1907 the Collections in this Division have been increased by the acquisition of 92 actual examples or models and 14 prints, drawings, etc.; besides these, 82 drawings for assistance in preparing new objects have been received on loan from manufacturers, and 16 similar drawings have been returned. Six objects which were formerly in the Museum have been again lent by the owners; one object hitherto on loan has been presented. There have been 11 cases of permanent withdrawal of objects by their owners, and 17 more which either were temporary or were followed by the substitution of newer specimens.

The following acquisitions are deserving of notice:—

Portable beam engine (1808). Purchased.

Workshop micrometer and limit gauges. Lent by the Newall Engineering Company.

General service pump. Lent by Messrs. G. & J. Weir, Ltd.

Early Macmillan bicycle. Purchased.

Examples of (i.) rear-driving safety, (ii.) "Kangaroo," (iii.) "Geared Facile," (iv.) "Bantam" bicycles. Lent by T. Edens Osborne, Esq.

Examples of ball bearings. Presented by Messrs. Ludw. Loewe & Co., Ltd.

Hele-Shaw friction clutch in section. Lent by the British Hele-Shaw Patent Clutch Co., Ltd.

Rear axle of motor car with worm driving gear. Lent by the Lanchester Motor Co., Ltd.

Models of (i.) Bremner's mortar box for stamp battery, (ii.) Huntington mill, and (iii.) Blanton's cams. Lent by Messrs. Fraser & Chalmers, Ltd.

Model of the Wilfley shaking table. Lent by the Wilfley Mining Machinery Co., Ltd.

Early carding engine. Presented by the English Sewing Cotton Co., Ltd.

Model of Martin's swath-turner. Made to order.

Pneumatic riveting hammer. Lent by Messrs. Samuelson & Co., Ltd.

Model of chain-pressing machine. Lent by Weldless Chains, Ltd.

Early pole lathe. Lent by Messrs. Thos. Noakes & Sons, Ltd.

Model of steel framework for theatre. Lent by Messrs. Drew-Bear, Perks & Co., Ltd.

Model of automatic sluices. Lent by A. T. Mirza, Esq.

Models of (i.) shears float, and (ii.) diving bell float. Lent by the Port & Docks Board, Dublin.

The following new objects have been made from drawings prepared by the staff, principally in the workshop attached to the Division; only a small part of the work having been done by outside contractors:—

Model of Parsons's improved type steam turbine, and model of a Curtis steam turbine.

Model of a "balloon" or "haystack" boiler; from particulars furnished by the Coalbrookdale Co.

Model of a Mond gas plant; from particulars supplied by the Power Gas Corporation, Ltd.

Model of a nitric acid plant; from particulars supplied by Oscar Guttmann, Esq.

Model of a column-guided gas-holder; from drawings lent by Messrs. Ashmore, Benson, Pease & Co.

The work of cleaning, repairing, sectioning and completing objects for exhibition and providing the gearing for setting them in motion where necessary, has gone forward in the workshop as usual, concurrently with the upkeep of the air compressing plant and of the models in motion. Of the latter the number in this Division that are in operation or can be worked by visitors is 147, showing a net increase of 11; the total number of such models in the Southern Galleries is now 225.

The work of registration of objects, and preparation of descriptive labels, of which 120 have been sent to the printers, has gone forward as usual. The third edition of Part I. (Prime Movers, etc.) of the Catalogue having been exhausted, a fourth edition was prepared, and was on sale to the public in December. A supplement of illustrations of the more important objects in this portion of the Collection was added. The descriptive handbill to the Southern Galleries was also revised.

The work in connection with photographing the more important objects for general and catalogue purposes has resulted in the production of 77 negatives, a few lantern slides, and 30 written descriptive labels for guard-book purposes.

About 150 students, accompanied by their teachers, have received special facilities for the examination of particular objects on the occasions of their visits. Upwards of 385 objects have been borrowed for the use of the professors in the Royal College of Science and Royal School of Mines.

NAVAL AND MARINE ENGINEERING DIVISION.

During the year 1907, the collections in this Division have been increased by the addition of 17 models, and 33 prints; besides these, 10 drawings for assistance in preparing new objects have been received. Two objects which had been in the Museum formerly have been again received; one object already

in the collection has been purchased; three objects have been on circulation. Of the withdrawals, four have been of a permanent character and three more have been either temporary or for the purpose of exchange.

Attention may be drawn to the following acquisitions:—

Whole built model of H.M. Frigate "Cleopatra" (1779) on launching ways of that period. Purchased.

Whole rigged model of Portuguese warship "Vasco da Gama" (1876). Purchased.

Whole rigged model of H.M. first class cruiser "Diadem" (1896). Lent by the Fairfield Shipbuilding and Engineering Co., Ltd.

Whole rigged model of S.S. "Servia" (1881). Lent by the Cunard Steamship Co.

Whole rigged model of S.Y. "Alberta" (1896). Lent by the Ailsa Shipbuilding Co.

Model of Lafargue's hydraulic steering gear. Purchased.

Model of Henson-Stringfellow flying machine and engine (1842). Presented by P. Y. Alexander, Esq. and C. H. M. A. Alderson, Esq.

Besides these there have been made from drawings prepared by the staff, in the workshop above alluded to:—

Working model of the engines of P.S. "Comet" (1812), a model of which was in the Museum.

Model of the ship structure in the way of the engines of H.M.S. "Agincourt" (1864), of which a model was already in the Museum.

Other minor work has been carried on concurrently with the upkeep of the working models, the number of which in this Division is now 78 showing a net increase of 1. The masts and rigging have been added to a model of a 32-gun frigate (1785) which was already in the Museum.

BUCKLAND FISH COLLECTION.

The hatching of salmonidæ during 1906 was carried out as usual and the number of living specimens of different years in the tanks was maintained. The work of cleaning, repainting the backgrounds, and framing the plaster casts of fish, was completed; this has improved their appearance as well as provided additional protection against injury.

The number of visitors to the Southern Galleries which comprise the Machinery and Inventions, the Naval, and the Buckland Collections was 405,987 after deducting the number of readers in the Science Library, access to which is now obtained through these Galleries. This total has not been exceeded in any previous year. The average attendance was 1,118 per diem including Sundays; on Sundays alone it was 921 and on week-days alone 1,151. The hourly attendance on Sundays was however more than twice as great as that on week-days.

The work of redecorating the whole of the Southern Galleries was commenced in November.

COLLECTIONS FOR SCIENTIFIC INSTRUCTION AND RESEARCH.

The following return shows the number of visitors to the Western Galleries during the last five years :—

Year.	Visitors.	Visitors receiving special assistance or facilities for the examination of Models & Apparatus.	Classes attending with their Teachers.	Approximate Average Number per Class.
1903	89,074	4,495	317	14
1904	87,314	3,955	268	15
1905	93,180	3,546	268	13
1906	87,629	3,396	242	14
1907	93,043	4,128	227	18

The number of objects acquired during the year is larger than for 1906, an increased number of purchases having been made with the view of developing the Physics Section.

The Analytical Engine by Maj.-General H. P. Babbage, which was incomplete on its receipt in the Museum in 1896, has been put in working order by the inventor and is now shown with the calculating machines of his father, the late Charles Babbage, F.R.S.

Photographs of the models of the old Jeypore astronomical instruments have been taken at the request of the Authorities of the Deutsches Museum, Maximilianstrasse, Munich, for exhibition in that Museum.

Eighty-three labels descriptive of the more recent acquisitions were prepared during the year, and a new hand-bill, showing by a plan the positions in the Galleries of the various collections has been issued for the use of the public.

The loans of apparatus, models and diagrams to the Royal College of Science for lecture purposes and laboratory work numbered 609 as compared with 593 in the previous year.

In Science Circulation 3 sets of apparatus, comprising 42 objects, were issued on loan.

The following table shows how these numbers compare with those of former years :—

Year.	Number of Schools to which sets of apparatus have been sent.	Number of sets of apparatus circulated.	Number of objects in the sets.
1903	9	10	363
1904	6	6	248
1905	4	6	120
1906	5	6	46
1907	2	3	42

The acquisitions during the year 1907 were as follows:—

How Obtained.	Microscope Slides, Lantern Slides, and Specimens.	Models and Instruments.	Maps, Diagrams, and Photographs.	Total.
Purchased - -	—	62	46	108
Presented - -	—	13	18	31
Lent - - -	—	14	24	38
	—	89	88	177

The most important of these additions are:—

Mathematics and Standards of Measurement:—

1. Catt's calculator. Purchased.
2. (*a*) Anderson's slide-rule. (*b*) Goulding's cursor for slide-rule. Purchased.
3. Carpenter's slide-rule, 1742. Lent by J. Lecky.

Physics:—

1. Clarke's import hydrometer. Purchased.
2. Fletcher's trolley apparatus for illustrating linear and angular accelerations. Purchased.
3. Set of Estève's reed pitch-pipes. Presented by A. S. Prior.
4. Pitch-pipe, 18th century. Purchased.
5. Berthelot's apparatus for the latent heat of vaporization of steam. Purchased.
6. (*a*) Direct-vision spectroscope by Hilger. (*b*) Spectroscope with diffraction grating on glass, by Watson. (*c*) Circular diffraction grating. Purchased.
7. (*a*) Early forms of the Wollaston camera lucida (2). (*b*) Early forms of camera obscura (2). Purchased.
8. A Varley graphic telescope. Purchased.
9. Small terrestrial telescope by Ramsden. Lent by J. Lecky.
10. (*a*) Early forms of photographic shutters (5). (*b*) Triplet lens by Chevalier. (*c*) Derogy lens. (*d*) Daguerre developing box. (*e*) Plate box. Purchased.
11. Hurter and Driffield's actinograph. Purchased.
12. Model showing absorption of solutions of potassium permanganate of varying concentration. Lent by J. H. Pledge and E. F. Witthaus.
13. Autochromes of solar spectra and carbon arc spectra. Presented by J. McIntosh.
14. Radiographs (10) of molluscal shells. Purchased.
15. Crookes' spinthariscope. Purchased.
16. (*a*) Mirror galvanometer used at Valentia in laying the original Atlantic cable, 1858. (*b*) Portions (2) of the original Atlantic cable, 1858. Lent by J. Lecky.
17. (*a*) Portion of the lightning conductor erected at St. Paul's Cathedral, latter part of the 18th century. (*b*) Aigrettes (2) for forming the air-terminals of lightning conductors. Lent by Killingworth Hedges.
18. Fleming's direct-reading cymometer. Purchased.

Mineralogy and Geology:—

1. Wollaston reflecting goniometer, early part of the 19th century. Purchased.
2. (*a*) Geological maps of the British Isles (2). (*b* Geikie's geological map of Ireland. Purchased.

Biology :—

1. Wilson microscope and two small pocket microscopes. Purchased.
2. Solar microscope by Benjamin Martin, 18th century. Purchased.
3. Microscope by Powell and Lealand, 1860. Purchased.
4. Photograph of section of the compound eye of the cockchafer. Purchased.
5. Photographs (19) to illustrate the structure of amphioxus lanceolatus. Purchased.

Physiography :—

1. Watkin's long-range aneroid. Purchased.
2. Mountain barometer by Troughton and Simms. Purchased.
3. Sextant by Joshua Lover Martin, 18th century. Purchased.
4. Pocket sextant by Dollond, early part of the 19th century. Purchased.
5. Gregorian telescope by J. Cuthbert, 1852. Presented by B. D. Bolas.
6. Circumferentor by Barrow. Purchased.
7. Calendar, with weather prognosticator, by Troake, 1831.
8. Marine hour glasses (3), early part of the 19th century.
9. Engraving, by the late John Russell, R.A , of the moon.

Hygiene :—

Photographs (15) of "Our Daily Food through microscope and camera. Presented by A. E. Smith.

THE SCIENCE LIBRARY.

The additions to the Library for the year 1907 comprise 749 volumes, of which 504 were purchased and 245 presented; 7,157 parts, pamphlets, &c., of which 5,085 were purchased and 2,072 presented; 248 maps, of which 2 were purchased and 246 presented; 17,428 specifications, &c., were added to the Patent Section. 999 books sent on approval by various booksellers were examined and dealt with during the year.

1,826 catalogue titles and cross references have been written during the year. The monthly catalogue titles from April, 1906, to September, 1907, were received from the printer. 2,930 titles were added to the Author Catalogue, and 809 to the Subject Index. The Author Catalogue now contains 31,972 cards, and the Subject Catalogue 33,531 cards. 594 cards were written or typed for the small MS. Subject Catalogue of recent additions to the Library. 13,533 cards were inserted in the Biological Bibliography of the Zurich Concilium Bibliographicum.

1,711 catalogue titles were mounted on cards, 3,946 volumes and parts were collated, and 391 volumes prepared for binding by the Library staff. 341 volumes have been bound and 8 volumes repaired.

In the course of the year the Library was removed to the new premises provided for it in Imperial Institute Road and communicating with the main part of the Science Museum.. The transference of the books occupied four months—August to November—but the use of the Library was not interrupted during that period. Advantage was taken of the opportunity to re-classify the Library, and the changes of press-marks, &c., which this necessitated are still in progress.

The visitors to the Library numbered 14,373, an increase of 72 over those of the preceding year, and to the Patent section 95, a decrease of 67 from those of the preceding year. The nett increase is, therefore, 5. In addition to the books issued to readers in the reading room, 2,131 were issued on loan to the professors of the Royal College of Science, 811 to officers of the Museum or Board of Education, and 186 to officials at the Museum of Practical Geology, Jermyn Street.

The following table shows the number of readers in the Library during the past five years:—

Year.	School Teachers, &c.	Students in Dept. Schools.	Consulters of Patent Specifications.	Other Readers.	Total.
1903 - -	1,818	6,942	189	4,053	13,002
1904 - -	1,365	8,436	214	4,238	14,253
1905 - -	1,556	8,646	135	3,765	14,102
1906 - -	1,185	9,421	162	3,695	14,463
1907 - -	1,253	9,293	95	3,827	14,468

Amongst the publications purchased may be mentioned :—

Archives of Skiagraphy (afterwards Archives of the Röntgen Ray). Edited by Sidney Rowland, *&c.* London, Philadelphia, 1908, *&c.* *8vo.*

Bailey, Liberty Hyde. Cyclopedia of American agriculture. Edited by L. H. Bailey. *In progress.* New York, 1907, *&c.* *4to.*

Bailey, Liberty Hyde. Cyclopedia of American horticulture. By L. H. Bailey, assisted by Wilhelm Miller. London, New York, 1900 (-1904). *4 vols.* *4to.*

Berlin: Königliche Friedrich-Wilhelms-Universität—Institut für Meereskunde.

Meereskunde. Sammlung volkstümlicher Vorträge zum Verständnis der nationalen Bedeutung von Meer und Seewesen. Erster Jahrgang *and onwards.* Berlin, 1907, *&c.* *8vo.*

Berlin: Societas Regia Scientiarum.

Aus Namaland und Kalahari. Bericht . . . über eine Forschungsreise im westlichen und zentralen Südafrica, ausgeführt in den Jahren 1903-1905 von Dr. Leonhard Schultze. Jena, 1907. *8vo.*

Berthelot, Marcellin Pierre Eugène, *and* Jungfleisch, Émile Clément. Traité élémentaire de chimie organique. Quatrième édition. Paris, 1908 [i.e. 1907]. *2 tom.* *8vo.*

Brachvogel, John Kudlich. Industrial alcohol. New York, 1907. *8vo.*

Chappuis, James, *and* Berget, Alphonse. Leçons de physique générale. . . . Deuxième édition. *In progress.* Paris, 1907, *&c.* *8vo.*

Darwin, *Sir* George Howard, *K.C.B.* Scientific papers. *In progress.* Cambridge, 1907, *&c.* *8vo.*

Economic Geology, with which is incorporated the American Geologist. Volume I *and onwards.* [Lancaster, Pa.], 1906, *&c.* *8vo.*

Elwes, Henry John, *and* Henry, Augustine. The trees of Great Britain and Ireland. *In progress.* Edinburgh, MCMVI, *&c.* *4to.*

France: Ministère de l'Instruction Publique. Expédition Antarctique française, 1903-1905, commandée par le Dr. Jean Charcot. . . . Documents scientifiques. *In progress.* Paris, 1906, *&c.* *4to.*

Gibbs, Josiah Willard. The scientific papers of J. Willard Gibbs. London, *&c.*, 1906. *2 vols.* *8vo.*

Great Britain and Ireland : India Office.

The Imperial Gazetteer of India. . . . New edition. *In progress.* Oxford, 1907, *&c.* *8vo.*

Haton de la Goupillière, Julien Napoléon. Cours d'exploitation des mines. Troisième édition revue . . . par Jean Bès de Berc. Paris, 1905 (–1907). *3 tom.* *8vo.*

Hough, Romeyn Beck. The American woods, exhibited by actual specimens and with copious explanatory text. Lowville, N.Y., 1893 (–1904). *10 vols.* *8vo.*

Hue, Edmond. Musée ostéologique. Étude de la faune quaternaire. *In progress.* Paris, 1907, *&c.* *8vo.*

Kozák, Josef. Grundprobleme der Ausgleichungsrechnung nach der Methode der kleinsten Quadrate. *In progress.* Wien und Leipzig, 1907, *&c.* *8vo.*

Larmor, Joseph. Memoir and scientific correspondence of the late Sir George Gabriel Stokes, Bart. Selected and arranged by Joseph Larmor. Cambridge, 1907. *2 vols.* *8vo.*

Meyer, Hans Heinrich Joseph. In den Hoch-Anden von Ecuador : Chimborazo, Cotopaxi, *&c.* Reisen und Studien. (*With Bilder*-Atlas.) Berlin, 1907. *2 vols.* *8vo and fol.*

Monographien über angewandte Elektrochemie.

Monographs on applied electrochemistry. Edited by Victor Engelhardt. Vol. 1 *and onwards.* Authorized . . . translation by J. W. Richards. Easton, Pa., 1904, *&c.* *8vo.*

New York : American Mathematical Society.

Transactions. Volume 1 *and onwards.* Lancaster, Pa., and New York, 1904, *&c.* *8vo.*

Ostwald, Felix Arthur Clair. A treatise on the geology of Armenia. Iona, Beeston, Notts., 1906. *8vo.*

Tassart, L. C. Exploitation du pétrole. Paris, 1908. *8vo.*

Thomann, Robert. Die Wasserturbinen, ihre Berechnung und Konstruktion. Herausgegeben von R. Thomann. Stuttgart, 1908. *8vo.*

Watt, *Sir* George. The wild and cultivated cotton plants of the world. A revision of the genus Gossypium. London, *&c.*, 1907. *8vo.*

Weyrauch, Jakob Johann von. Grundriss der Wärmetheorie. Stuttgart, 1905 (–1907). *2 Hälfte.* *8vo.*

Wohlgemuth, L. Max. Laboratoriumsbücher für die chemische und verwandte Industrien. Herausgegeben von L. Max Wohlgemuth. *In progress.* Halle a. S., 1907, *&c.* *8vo.*

The more important presentations include :—

Bashforth, Francis. Ballistic experiments from 1864 to 1880. Cambridge, 1907. *8vo.*

Dortous de Mairan, Jean Jacques. Dissertation sur la glace, ou explication physique de la formation de la glace, & de ses divers phénomènes. Paris, MDCCXLIX. *8vo.*

Florence : Accademia del Cimento.

Essayes of natural experiments made in the Academie del Cimento. . . . Englished by Richard Waller. London, 1684. *4to.*

Howgrave-Graham, R. P. Wireless telegraphy for amateurs. London, [1907]. *8vo.*

London : British Museum.

National Antarctic Expedition 1901–1904. Natural History. *In progress.* London, 1907, *&c.* *4to.*

Transvaal : Geological Survey.

Memoir No. 2 *and onwards.* Pretoria, 1906, *&c.* *8vo.*

Warner, Worcester R., *and* Swasey, Ambrose. A few astronomical instruments from the works of Warner and Swasey, Cleveland, Ohio, U.S.A. [New York & Pittsburg], MDCCCC. *8vo.*

HEATING AND LIGHTING OF THE MUSEUM.

The following table has been prepared from the temperature records taken throughout the year at certain parts of the permanent buildings of the Museum :—

Station.	Diurnal Variation.		Temperature.		
	Max.	Mean.	Min.	Mean.	Max.
	F°	F°	F°	F°	F°
Jones Gallery - - - -	10	4·16	51	61·64	74
Sheepshanks (South Room) -	9	3·37	53	61·64	74
Raphael Gallery - - -	9	3·42	51	61·65	73
Water Colours (N.W. Room) -	11	4·21	46	62·27	75
North Court (Centre) - -	10	4·10	53	61·79	72
South Court (East) - - -	8	3·29	54	61·47	73
South East Court - - -	6	2·00	52	61·42	69
Standard in Air - - -	24	10·47	24	50·76	80

The mean temperature for the eight months during which the Museum was artificially heated was 60·86° ; that of the outside air was 46·25°.

The cost of electric current for the Museum and Offices including the Royal College of Art and the old buildings of the Royal College of Science, was £3,030 13s. 3d.; that of carbons for arc lamps £120 0s. 0d.; and the renewal of glow lamps £104 10s. 0d. The cost of gas was £1,831 19s. 8d.; and the renewal of mantles, chimneys, etc., £12 10s. 0d. These figures include electricity and gas used for power and heating purposes.

BETHNAL GREEN MUSEUM.

The number of visitors to the Bethnal Green Museum during 1907 was 413,367, which shows a decrease of 20,482 as compared with the previous year; the total since the opening of the Museum in 1872 was 18,133,467. The day attendance on week days was 243,065, the evening attendance 100,580, and on Sundays 69,722. The greatest number in one day was 4,987 on the 3rd January, and the least 210 on the 17th September. The average week-day attendance was 1,105, and on Sundays 1,341. The visitors included 1,226 teachers and scholars from schools in the neighbourhood.

Among various art objects transferred from the Victoria and Albert Museum the principal were two oil paintings, 30 pieces of modern German porcelain, and a dessert service of 33 pieces of Staffordshire porcelain. In addition, Mrs. S. D. Sassoon lent a few pieces of metalwork connected with Jewish ritual, and Sir Watkin Williams Wynn, Bart., a sedan chair made for Lady Williams Wynn about 1772 from designs by one of the brothers Adam.

The Food Collection was increased by two small cakes of chestnut meal, as eaten by the natives of Corsica, given by T. R. Allinson, Esq., and a series of 15 photographs of food seen through the microscope, given by A. E. Smith, Esq.

The Collection of Beetles was examined and attended to where necessary by Miss C. L. Adams.

The Doubleday Collection of Lepidoptera was visited by 90 persons.

THE ART MUSEUM RETURNS.

(Including Indian Section.)

(1.) LIST OF CONTRIBUTORS OF LOANS TO THE ART MUSEUM, 1907.

Bidder, M. M., Esq.
Six examples of Siamese silversmiths' work, earthenware and porcelain.

Bland, Mrs. J. P.
Collection of Chinese enamels, and carved lacquer-work from Soochow.

Broun, W. H., Esq.
Emerald bow-ring, and cup on enamelled and jewelled gold foot. Mogul (Delhi); 17th century.

Corrie, W., Esq.
Four specimens of English cut-glass; first half of 19th century.

Devonshire, The Duke of, K.G.
Tapestry, "Falconry," woven in the Flemish style; towards the middle of the 15th century. From Hardwick Hall.

Ellis, H. D., Esq.
Additions to his collection of silver.

Ewart, Captain
Moorish saddle in purple velvet.

FARQUHARSON, COL. V. A.
Additions to his collection of arms and armour.

FITZHENRY, J. H., ESQ.
Additions to his collection of silversmiths' work, metalwork porcelain, etc.

GROSSMITH, WEEDON, ESQ.
English two-handed sword and scabbard; 14th century.

HEARN, A. W., ESQ.
Tabard embroidered with the arms of the Stuart Kings; probably for Lyon King-at-Arms. Scottish; 17th century.

HORSFORD, MRS.
Burmese carved-wood screen, and five Chinese celadon-glazed stoneware dishes.

LYONS, LT.-COL. G. B. CROFT, F.S.A.
Additions to his collection of metalwork, furniture, plate, etc.

MORGAN, J. PIERPONT, ESQ.
Additions to his collection of sculpture, silver, enamels, bronzes, earthenware, etc.

NORTH OCKENDON, VICAR & CHURCHWARDENS OF.
A silver Communion cup, of the year 1646–7.

PARLETT, L. M., ESQ.
Collection of Burmese wood-carving, costumes, lacquered ware, tilework and pottery. 18th and 19th centuries.

PRICE, F. G. HILTON, ESQ., DIR. S.A.
Additions to his collection of watches.

RAWDON, CANON J. H.
Syrinx of carved soapstone, found in a Peruvian tomb, and book with description.

RIVAZ, SIR C M., K.C.S.I.
Panel embroidered with a panoramic representation of the marriage of a Rajput chief. Kangra, Panjab; early 19th century.

SALTING, G., ESQ.
Additions to his collection of bronzes, porcelain and earthenware, etc.

SASSOON, MRS.
Various objects in metalwork connected with Jewish ritual; 17th and 18th centuries.

SKINNER, A. B., ESQ., F.S.A.
Painted enamel plaque of St. Christopher, in metal frame.

TANNER, MISS F.
Silver-gilt standing cup and cover. English; first quarter of 17th century.

TARSIS, CONTESSA.
Plaster-cast head of Dante.

TATLOCK, MISS H. H.
Thirty-five water-colour paintings by Peter de Wint.

TIPPING, COL. W. F.
Hispano-Moresque ewer of the second half of the 15th century.

VACHER, S., ESQ.
Additions to his collection of lace.

WHITE, MRS. BROOMAN.
Shawl of pillow-made appliqué lace. Brussels; first half of 19th century.

(2.) LIST OF DONATIONS AND BEQUESTS (EXCLUDING PAINTINGS) DURING THE YEAR 1907.

ALEXANDER, MRS.
Embroidered cambric handkerchief, with Royal arms and views of palaces; English; about 1851. 962–1907.

ALEXANDER, W. C., ESQ.
Five pieces of embroidered silk. Italian; in the style of the 17th century. 459–1907.

BARRINGTON, THE HON. SIR WILLIAM, K.C.M.G.
Embroidered satin hanging. Roumanian; second half of 19th century. 899–1907.

BEAUMONT-KLEIN, L. DE, ESQ.
Jug of Liverpool ware, dated 1804. 386–1907.

BREADALBANE, THE MARQUIS OF, K.G.
Four silver spoons and toddy-ladles. Scotch; early 19th century. 147 to 152–1907.

BURKINYOUNG, Miss E.
Modern brooch pendant of Roman mosaic. 844–1907.

BURMAN, A., ESQ.
Collection of blue and white Chinese porcelain, chiefly of the K'ang Hsi period. (1662–1722). 817 to 833–1907.

CARRINGTON, J. B., ESQ.
Silver gilt chalice. Dutch (Zwolle ?); dated 1524. 354–1907.

CARTER, MR. W. C.
Boxwood nutmeg grater. English; first half of 19th century. 135–1907.

CHADLY, L. B., ESQ.
Eight enamelled earthenware tiles. Tunisian; 19th century. 779–1907.

CHARBONNIER, T., ESQ.
Wrought iron ornament from a chain. Italian; 18th century. 420–1907.
Two pieces of wood-carving. English; about 1500. 437, 438–1907.

CONYBEARE, H. M., ESQ.
Woollen pile carpet. Axminster; first half of 19th century. 167–1907.

COOMARASWAMY, DR. A. K.
Wooden hand-loom (algé). Sinhalese (Kandy); early 19th century. 705–1907.

COULING. H., ESQ., THE LATE.
A Chinese porcelain dish of the Yung-chêng period, and a set of four vases of Worcester porcelain, 18th century. 719 to 721–1907.

DE CHAPEAUROUGE, MRS.
A French and a Chinese porcelain plate. 125, 126–1907.

DENT, MISS E. B., THE LATE.
Carved rhinoceros horn; two carved lacquer bowls and case. Chinese. 326 to 328–1907.

DICKSON, R. E., ESQ.
Glass quarry from Glemham Hall. Suffolk; dated 1768. 843–1907.

EGYPT, THE BRITISH SCHOOL OF ARCHÆOLOGY IN.
Ancient Egyptian objects from excavations at Rifa, Zaraby and Gîza; Ist to XVIIIth dynasty. 734 to 757–1907.

EGYPT EXPLORATION FUND, THE.
Five ancient Egyptian objects from Deir-el-Bahri; XIth to XVIIIth dynasty. 726 to 730–1907.

ELIAS, E., ESQ.
Green glass vase. Chinese; 18th century. 362–1907.

FAIRBAIRNS, W. H., ESQ.
Bust of John Wesley in Newbottle glazed earthenware. 269–1907.
Wedgwood teapot; 19th century. 411–1907.

FARMER, C. B., ESQ.
Collection of English glass; Staffordshire lustred earthenware goblet 19th century. 104 to 120–1907.

FITZHENRY, J. H., ESQ.
Staffordshire glazed earthenware jug; early 19th century. 166–1907.
Pair of Sheffield plate snuffers, 168–1907.
Pair of enamelled brass stirrup-irons. English; 17th century. 914–1907.

FORRER, DR. R.
Wrought iron hinge-band. Modern reproduction of German 14th century work. 898*a*–1907.

GEMMELL, MISS.
Five fragments of embroidered net. Italian; 17th century. 761–1907.

GLINN, MRS.
Collection of coins, ironwork and brocade. 189 to 268–1907.

GULLAND, MRS. W. G.
Collection of Chinese porcelain, illustrating the style of decoration of the Yung-chêng period. 578 to 695–1907.

HALSE, MRS. F. J.
Chess table and set of men. Southern Indian; 18th century. 335–1907.
Enamelled gold ring. English; 1791. 325–1907.

HANSLIP, MISS ALICE, THE LATE.
Silver pomander, English, late 18th century; Bilston enamelled box, about 1800; Chinese porcelain tea-caddy and stand, late 18th century, 330 to 333–1907.

HAZEON, P., ESQ., THE LATE.
Leather saddle and appointments. Mexican. 57–1907.

HIND-SMITH, MRS. R. S.
Sedan-chair. English; late 18th century. 322–1907

JEFFERSON, H., ESQ., M.D.
Two Bohemian glass bottles and a Spanish glass vase. 781 to 783–1907.

KNOX-JOHNSON, MRS.
Carved wood figure. Probably Tyrolese; 16th century. 559–1907.

LEWIS, MRS. M., THE LATE.
Embroidered woollen scarf. Kashmir (Srinagar); early 19th century. 501–1907.

LEWIS-HILL, MRS., THE LATE.
Two pillow-made-lace flounces. North Italian and Brussels; 17th and early 18th centuries. 292, 293–1907.

LINDLEY, MISS J.
Embroidered cloth mantle. Montenegrin; second half of 19th century. 702–1907.

LUND, C., ESQ.
Two bronze candlesticks. Old Japanese. 397–1907.
Two pairs of clogs, and a pair of slippers. 398 to 400–1907.

LYON, H. THOMSON, ESQ., F.S.A.
Green glass bottle. Persian; 19th century. 387–1907.

LYONS, LIEUT.-COL. G. B. CROFT.
Four lead window quarries. English; 18th century. 60–1907.
Plate of Fulham stoneware. 18th century. 462–1907.
Glass salt-cellar. German; 18th century. 876–1907.
Three English pincushions; 17th and 18th centuries. 911 to 913–1907.

MARLING, C. M., ESQ.
Glass bottle. Persian; 17th or 18th century. 338–1907.
Silk brocade cover. Persian; 17th century. 868–1907.

NARISCHKINE, B. G., ESQ.
Two dishes of Wedgwood's cane-coloured ware. 956, 957–1907.

NATHAN, MESSRS. L. & H.
Pleated cambric stock. English ; early 19th century. 762–1907.

ORCHARDSON, SIR W. Q., R.A.
Grand piano and upright harp-shaped piano, both decorated in the "Empire" style. 460, 461–1907.

PRITCHETT, R. T., ESQ., THE LATE.
Twenty-seven Japanese netsukes ; 18th and 19th centuries. 790 to 816–1907.

READ, CHARLES HERCULES, ESQ., P.S.A. (through the National Art Collections Fund).
Two silver medals : William III. and Mary II. 407, 408–1907.

ROSENHEIM, MAX, ESQ. (through the National Art Collections Fund).
Three testoni of Ercole d'Este. 404 to 406–1907.

SMITH, D. H. J., ESQ.
Triangular encaustic tile. English ; 13th or 14th century. 910–1907.

SPIERS, R. PHENÉ, ESQ.
Two cast-iron plaques by Professor E. Lantéri, for the R. Phené Spiers testimonial. 302, 303–1907.

TABOR, J., ESQ.
Twelve Dutch tiles ; 18th century. 61–1907.

TAYLOR, MRS. E.
Set of ivory chessmen. Chinese. 294–1907.

THOMPSON, M. R., ESQ.
Frontal of painted cartonnage. Egyptian ; 1st century A.D. 384–1907.

TYSON, A., ESQ.
Collection of Japanese and other objects. 62 to 103, 121, 122–1907.

VACHER, S., ESQ.
A Pinxton and a Tournay porcelain plate. 131, 132–1907.
Seven books and two bookbindings. 179 to 187–1907.
Ten parchment lace-"downs ;" 24 King-pins. 271 to 281–1907.
Set of baby's knitted cotton clothes, with bead work. 380–1907.
Black woollen lace border, Mirecourt, Le Puy. 381–1907.
Porcelain vase. Chinese, of the K'ang Hsi period (1662–1722). 869–1907.
Silver thimble. 870–1907.
Mother-o'-pearl spool. 871–1907.
Pincushion and two pieces of ribbon ; 13 King-pins. 872 to 875–1907.
Fifteen pieces of woodcarving of various periods. 877 to 891–1907.
Two leather bookbindings. French ; 18th century 907, 908–1907.

WATTS, W. W., ESQ., F.S.A.
Carved bone box, made by French prisoners at Perth ; early 19th century. 725–1907.

WESLEY, MRS. M. M., THE LATE.
Eighteen panels of stained and painted glass. Dutch or German ; 17th or 18th century. 928 to 945–1907.

WIDDEN, W. F., ESQ., M.R.C.V.S.
Twelve iron bosses and eleven iron nails. Spanish ; about 1600. 124-1907.

WILLETT, E., ESQ., M.D.
Seven fragments of bricks from Rangpur, Sibsagar. Indian (N.E. Assam) ; 17th century. 964 to 970–1907.

(3) LIST OF PAINTINGS ACQUIRED DURING THE YEAR BY GIFT AND BEQUEST.

DUCKWORTH, MISS.
Water-colour : –
Ernest Dade.
Fishing Boats at Whitby. D. 71–1907.

MARLING, SIR, W. H., BART.
Water-Colour :—
A. W. Rimington, R.B,A., A.R.E.
Assisi—Early Morning. D. 872–1907.

TOMSON, MRS. ARTHUR.
Oil Painting :—
Arthur Tomson.
The Chalkpit. 134–1907.

WEST, MRS. RICHARD WHATELY.
Oil Paintings :—
Richard Whately West.
Ponte Garessio. 566–1907.
Ponte Lungo, Andora. 567–1907.
Valley of Andora. 568–1907.

(4) LIST OF WATER-COLOUR PAINTINGS AND DRAWINGS ACQUIRED BY PURCHASE.

Boys, Thomas S. Cathedral of Notre Dame, Paris. D. 1588–1907.

Callow, William, R.W.S., F.R.G.S. Easby Abbey, Yorkshire. D. 1839–1907.
Town Hall, Bruges. D. 1840–1907.

Cotes, Penelope. Portrait of a lady (miniature on ivory). 412–1907.

Downman, John, A.R.A. Lady Hildyard. D. 709–1907.

Engleheart, George. Portrait of a lady (miniature on ivory). 357–1907.

Engleheart, John, C.D. Portrait of a young girl (miniature on ivory). 413–1907.

Green, Charles, R.I. Two illustrations for Dickens' "The Old Curiosity Shop." D. 387, 388–1907.

Lawson, Cecil Gordon. In the Wharfedale, Yorkshire. D. 167–1907.

Mee, Mrs. Anne. Mrs. Whitworth (miniature on ivory). 389–1907.

Pritchett, Mrs. R. T. Attock on the Indus. D. 1604–1907.

Richter, Christian. Dr. John Radcliffe (miniature on card). 478–1907.

Rowlandson, Thomas. La Place de Meir, Antwerp. D. 389–1907.

Ruskin, John. A dead pheasant. D. 394–1907.

Serres, John Thomas. Entrance to a harbour. D. 13–1907.

Shelley, Samuel. Head of a lady (miniature on paper, pencil, tinted). D. 383–1907.

Smart, John. Sir Philip Francis, reputed author of The 'Letters' of "Junius" (miniature on ivory.) D. 479–1907.

Spencer, Gervase. Portrait of a lady (miniature on ivory.) 390–1907.

Stark, Arthur James. Calves. D. 1587-1907.

Stark, James. Dover. D. 1585–1907.
Winterton. D. 1586–1907.

Ward, James, R.A. Horses and foals D. 877-1907.

ABSTRACT OF OBJECTS ACQUIRED FOR THE ART COLLECTIONS (EXCLUDING CASTS AND ELECTROTYPES) BY PURCHASE OR GIFT, DURING THE YEAR ENDING 31ST DECEMBER, 1907.

Class.	——	Given.	Bought.	Cost.
				£ s. d.
I.	Sculpture in marble, stone, &c.	14	17	247 11 9
II.	Mosaics in stone and glass.	1	—	—
III.	Carvings in ivory, bone, tortoiseshell, &c.	33	3	25 0 0
IV.	Woodwork, furniture, &c.	47	89	1,910 6 5
V.	Metalwork.	27	57	854 5 0
VI.	Coins and medals.	79	17	122 3 6
VII.	Arms and armour.	6	5	10 0 0
VIII.	Silversmiths' work.	9	20	679 4 9
IX.	Jewellery and goldsmiths' work.	1	5	16 10 0
X.	Enamels on metal.	3	4	284 13 3
XIA.	Earthenware and stoneware.	27	84	3,376 1 10
XIB.	Porcelain.	145	1	25 0 0
XII.	Glass vessels, &c.	23	1	5 0 0
XIII.	Painted and stained glass.	20	25	290 0 0
XIV.	Leatherwork, bookbindings, &c.	12	2	3 0 0
XV.	Textile fabrics and embroidery.	22	132	1,178 9 1
XVI.	Lace.	15	19	71 11 5
XVII.	Musical instruments.	2	6	89 16 4
XVIII.	Paintings in oil, water-colour, &c.	8	7	371 4 3
	Total.	494	494	9,559 17 7

THE ART LIBRARY RETURNS.

(1) LIST OF DONATIONS AND BEQUESTS DURING THE YEAR 1907.

(a) Books.

BAKER, C. E., ESQ.
Catalogue of autographs, books, etc. 1907.

BÉARN, COUNTESS R. DE.
Froehner (W.). Collection de la Comtesse R. de Béarn. 2 vols. 1905–7.

BELL, MISS GERTRUDE LOWTHIAN.
Notes on a journey through Cilicia and Lycaonia. 6 parts. 1906.

BRINCKMANN, DR. JUSTUS.
Hamburg: Museum für Kunst und Gewerbe, Berichte. 1899–1901; 1903–1905.
Die Ankäufe auf der Weltausstellung, Paris 1900. 1901.
Ausstellung Ostasiatischer Kunst, 1904. Katalog. 1904.

BRUGES: TOISON D'OR EXHIBITION, 1907.
The British Committee. Catalogue, with supplement. 2 copies.

BRUSSELS: ACADÉMIE ROYALE DES BEAUX-ARTS.
Bibliothèque artistique. Ier supplément au catalogue. 1906. 2 copies.

BUDAPEST: FRANKLIN TÁRSULAT.
Zágoni Mikes Kelemen. Törökországi Levelei. 1906.

BUDAPEST: MUSÉE HONGROIS DES ARTS DÉCORATIFS.
Radisics (J.). Guide to the Musée Georges Ráth, Budapest. 1906.

CANNON, H. W., ESQ.
Richter (J.P.). Catalogue of Old Masters of the Italian School. (Villa Doccia, Fiesole). 1907.

CHICAGO: JOHN CRERAR LIBRARY.
List of books on industrial arts. 1904.

CHURCHILL, S. J. A., ESQ., M.V.O.
Ferrari (F.). L'Oreficeria in Aquila. 1906.
Bibliografia Celliniana. 1907.

CONTARINI, SIGNOR E.
La casa ove nacque il pittore B. Ramenghi. 1907.

COOMARASWAMY (DR. A. K.).
The teaching of drawing in Ceylon. 1906.

CORBETT, T., ESQ.
Shrewsbury illustrated. The official guide. 1906.

COSMA, FRAU MINERVA.
Album de brodării si testături românesti. (1907).

COURTENAY, MISS.
Kingdon (J.A.). Richard Grafton, Citizen and Grocer of London. 1901.

DAWSON, C., ESQ.
The "restorations" of the Bayeux Tapestry. 1907.

DELAHERCHE, MONSIEUR A.
Exposition Delaherche, Musée des Arts Décoratifs, Paris, 1907. Catalogue. 1907.

DENT, MESSRS. J. M., & CO.
Muther (R.). The history of modern painting. 4 vols. 1907.

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Osborne, Malcolm, Esq., A.R.E.
Etchings (3) by M. Osborne.

Perry, J. Tavenor, Esq.
Engraving of the interior of Durham Cathedral.

Short, Frank, Esq., A.R.A., R.E.
Etched state of the mezzotint of "Crowhurst, Sussex," by F. Short, after J. M. W. Turner, R.A.

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Turner, C. M. W., Esq.
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Young, the late Miss F. J.
Mezzotint by W. Say of Sir T. Lawrence's portrait of Mrs. Siddons.

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Richardson, J. S., Esq.
Tracing of a measured drawing of the tomb of the Duchess of Suffolk in Ewelme Church, Oxon., by J. S. Richardson.

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Pen drawing, "London's Opportunity," by Louis Weirter; with three proofs of reproduction.

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Presented by Sydney Vacher, Esq. A.R.I.B.A.

Two photographs of drawings of Hyde Park Corner.
Presented by E. J. May, Esq., F.R.I.B.A.

(c) Photographs.

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(2.) Reading Room Returns.

	1903.	1904.	1905.	1906.	1907.
Attendances of Readers (A.L.)	16,724	17,708	19,470	17,134	18,874
Works (volumes and portfolios) consulted (A.L.)	36,811	38,221	42,680	62,797	85,697
Attendances of Readers (Dyce and Forster L.)	335	238	354	295	380
Works consulted (Dyce and Forster L.)	1,105	1,002	1,447	1,546	2,077

(3.) Abstract of Acquisitions for the Art Library, by Purchase or Gift, during the Year ending 31st December, 1907.

Class.		Given.	Bought.	Cost.
				£ s. d.
I.	Books	348	1,477	1,250 14 5
II.	Manuscripts	—	6	21 4 6
III.	Drawings	497	1,380	766 4 6
IV.	Prints	145	550	*498 12 2
V.	Photographs †	486	1,936	87 12 11

* £50 was contributed by the National Art Collections Fund.

† 658 Photographs from official negatives were also received, and 173 were transferred from other sections.

(4.) Transfers and Loans.

	Volumes.	Drawings.	Prints.	Photographs.
Transferred to Circulation	27	—	—	250
Lent to Circulation, to other Divisions or to Students	1,346	522	312	1,884

CIRCULATION RETURNS.

(1.) RETURN of PROVINCIAL MUSEUMS and EXHIBITIONS to which ART COLLECTIONS and SCIENTIFIC OBJECTS have been contributed during the YEAR 1907, showing NUMBER of OBJECTS, &c., lent, VISITORS, and RECEIPTS.

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
						£ s. d.
Accrington	January to July	112	36	311	12,408	Free
"	July to December	86	68			
Alexandra Palace	January to December	99	—	—	—	—
Bath	January to December	76	—	231	42,191	5 0 0
Belfast	January to December	164	22	303	198,666	Free
Birmingham	January to April	184	—	365	435,022	Free
"	April to December	150	—			
Blackburn	January to November	146	31	213	5,160	Free
"	November and December	121	20			
Blackpool	January to September	18	45	—	28,764	—
"	September to December	17	37			
Bolton, Mere Hall	January to November	87	169	176	29,183	Free
Bootle	January and February	160	12	302	38,707	Free
"	February to December	172	191			
Bradford	January to June	19	69	—	—	—
"	June to December	—	371			
Brighton	November and December	174	—	60	25,404	Free
Bristol	January to December	101	88	336	348,594	Free
Burnley	January to October	75	87	—	—	Free
"	November and December	100	87			
Burslem	January to September	167	60	302	17,951	Free
"	September to December	114	23			
Bury	September to December	150	18	62	17,622	Free
Bury St. Edmunds	January to October	67	27	180	3,607	13 18 0
Buxton	January to May	104	41	310	5,404	Free
"	May to December	96	55			
Camberwell	January to December	192	177	—	—	—
Canterbury	January to December	85	—	309	27,337	Free
Cardiff	January to December	48	12	—	—	—
Carlisle	January and February	158	118	311	37,817	Free
"	February to December	102	22			
Chelmsford	January to December	147	11	209	11,682	Free
Cheltenham	January to December	203	189	300	12,602	Free
Chester	January to March	63	48	313	11,653	30 9 0
"	March to December	108	51			
Cork	January to December	148	23	—	—	—
Darwen	January to November	54	17	—	—	—
Derby	January to December	99	22	—	—	—
Devonport	January and February	103	49	305	27,883	Free
"	February to December	98	25			
Dewsbury	January to September	10	25	—	—	—
"	September to December	54	22			

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
						£ s. d.
Dover	January to December	135	25	189	21,886	Free
„	December	122	11			
Dublin	January to December	139	25	—	—	—
Dundee, Albert Institute	January to December	188	554	328	180,768	Free
Dundee, Dudhope Park	January to December	88	41	358	130,959	Free
Eastbourne	January to December	117	—	—	49,310	Free
„	December	70	—			
Edinburgh	January to December	1,457	257	—	—	—
Exeter	January to December	163	9	293	81,931	Free
Folkestone	January to April	111	11	312	29,261	Free
„	April to December	102	10			
Glasgow, Kelvingrove	March and April	—	1	365	703,682	Free
Glasgow, People's Palace	January to December	111	72	365	279,371	Free
Glasgow, Camphill House	January to December	120	33	365	67,717	Free
Glasgow, Toll Cross	January to December	84	—	365	127,662	Free
Greenock	January and February	94	15	264	14,113	Free
„	February to December	104	15			
Halifax	January to December	80	29	317	66,320	Free
Hanley	January to December	191	36	283	32,942	Free
Hastings	January to December	99	—	295	30,300	Free
Hull	January to December	116	46	311	126,936	Free
Ipswich	January to April	80	69	—	—	—
„	April to December	84	29			
Keswick	January and February	69	19	315	2,066	38 12 8
„	February to December	67	223			
Kidderminster	January to December	89	8	—	—	—
King's Lynn	January to December	84	28	309	7,021	—
„	December	134	15			
Leeds	January	119	4	311	269,909	155 3 6
„	January to December	157	6			
Leek	January to December	138	109	282	9,415	Free
Leicester Art Gallery	January to December	45	—	352	126,582	Free
Leicester School of Art Museum	January to June	191	170	—	—	—
„ „ „ „	June to December	149	255			
Lichfield	January to December	6	42	310	13,338	Free
„	December	—	120			
Lincoln	January to November	95	36	250	1,440	Free
„	November and December	111	4			
Macclesfield	January to December	66	14	204	3,252	Free
Maidstone	January to December	108	—	301	105,611	Free
„	December	221	—			
Manchester School of Art Museum	January to September	121	70	287	12,115	Free
„ „ „ „	September to December	185	44			
Manchester, Queen's Park	January to May	103	—	350	151,874	Free
„ „ „ „	October to December	109	—			

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
						£ s. d.
Middlesbrough -	January - - - -	113	25	—	—	—
Newcastle-upon-Tyne - - -	January to December -	212	201	—	116,880	—
Newport (Mon.) -	January to December -	145	11	241	21,470	Free
Nottingham - -	January to October -	71	—	341	321,720	200 14 10
„ - -	October to December -	74	264			
Oldham - - -	January to December -	102	174	284	95,544	69 7 2
Paisley - - -	January to December -	201	10	309	141,494	Free
Perth - - -	January to December -	140	32	312	32,654	Free
Plymouth - -	January to December -	108	27	362	25,830	Free
Poole - - -	January to November -	225	65	312	2,734	Free
„ - - -	November and December	87	75			
Portsmouth - -	January to December -	86	6	—	35,930	Free
Preston - - -	January to December -	116	43	363	82,260	Free
Reading - - -	January to December -	90	150	309	102,228	Free
Rochdale - - -	January to May - -	101	—	291	54,798	Free
„ - -	May to December - -	76	102			
Rochester - -	January to October -	84	—	209	21,031	Free
Rotherham - -	January to December -	200	182	311	59,538	Free
Rugby - - -	January to December -	96	53	78	8,087	Free
St. Albans - -	January to July - -	130	19	303	11,094	Free
„ - - -	July to December - -	94	59			
Salford - - -	January to December -	83	—	308	75,182	Free
Sheffield, Mappin Art Gallery - -	January to December -	109	—	312	263,822	Free
„ „ „	December - - -	254	—			
Sheffield, High Hazels	January to December -	63	26	364	45,508	Free
„ „	December - - -	81	20			
Stockport - -	January to December -	82	6	153	27,326	Free
Stoke-upon-Trent -	January to December -	121	56	306	61,645	Free
Sunderland - -	January to July - -	104	108	305	134,740	Free
„ - -	July to December -	185	234			
Truro - - -	January and February -	159	37	307	21,885	Free
„ - - -	February to December -	144	61			
Tunstall - - -	January to December -	277	20	298	11,455	Free
Warrington - -	January to August -	97	—	207	28,048	Free
„ - -	August to December -	81	—			
Wednesbury - -	January to December -	118	29	313	15,451	Free
West Bromwich -	January to December -	137	43	—	30,899	Free
Weston-super-Mare-	January to June - -	119	44	298	12,286	Free
„ „	June to December - -	73	43			
Wolverhampton -	January to March - -	184	141	328	101,039	Free
„ - -	March to December -	116	139			
Worcester - -	January to December -	219	—	308	73,300	Free
Yarmouth, Great -	January to April - -	85	—	313	46,279	Free
„ „ -	April to December -	75	—			
York - - -	January to July - -	128	35	310	6,081	Free
„ - - -	July to December - -	151	—			

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
						£ s d.
Exhibitions:						
*Bolton	October	60	168	—	—	—
„ Hall-i'-th-Wood	May to November	38	35	—	—	—
Bloemfontein	July to December	56	49	—	—	—
Bruges	May to October	2	—	—	—	—
Dublin	April to November	34	118	—	—	—
*Dublin	November	60	168	—	—	—
Hertford	June	95	52	—	—	—
*Ipswich	October	60	168	—	—	—
Jamaica, Institute of	January to March	15	63	—	—	—
*Leeds	October and November	60	168	—	—	—
Lincoln	November	109	209	—	—	—
Liverpool	April	—	1	—	—	—
London:						
Bermondsey	May	—	25	—	—	—
Burlington Fine Arts Club	April to July	12	—	—	—	—
National Gallery of British Art	April to December	—	22	—	—	—
Society of Arts	April to May	29	—	—	—	—
Whitechapel Art Gallery	January to April	4	3	—	—	—
Whitechapel Art Gallery	September to December	272	84	—	—	—
Manchester (Heaton Hall)	May to October	33	—	—	—	—
Mannheim	March to November	—	16	—	—	—
Milan	January and February	—	21	—	—	—
Newport (Bath and West of England Society)	May and June	—	56	—	—	—
New Zealand	January to July	36	73	—	—	—
Northumberland (Handicrafts Guild)	July and August	27	—	—	—	—
Swansea	August and September	181	48	—	—	—
Tillicoultry	April	90	10	—	—	—
Toronto (Canada)	July to October	—	3	—	—	—
Lectures:						
Art Workers Guild	April	138	—	—	—	—
„ „	July	103	18	—	—	—
„ „	November	27	4	—	—	—
London County Council	January	2	—	—	—	—
Society of Antiquaries				—	—	—
Society of Arts	June	6	—	—	—	—
„ „	April	3	—	—	—	—
	May	12	17	—	—	—
Lantern slides lent to 79 Schools of Art and other Institutions		—	3,328	—	—	—
Provincial Museums		16,399.	7,368	—	—	—
Exhibitions		1,273	1,560	—	—	—
Lectures, &c.		291	3,367	—	—	—
Total		17,963	12,295	—	—	—

* These Exhibitions consisted of a selection of the prize works executed by students for the National Art Competition.

(2.) Return of Schools of Art and Art Classes to which Objects, Paintings, Drawings, Photographs and Books have been lent for the purpose of Study during the Year 1907.

Name of School or Class.	Objects.	Paintings, Drawings, and Photographs.	Books.
English Schools, etc. :—			
Acton and Chiswick	—	23	1
Accrington	17	1	2
Ashton-under-Lyne	19	29	5
Aston Manor	34	25	—
Bakewell	—	2	—
Banbury	16	13	—
Barnstaple	—	27	—
Barrow-in-Furness	15	—	4
Bath	16	9	8
Batley	40	32	11
Beckenham	20	76	18
Bedford	—	10	—
Bideford	15	—	8
Bingley	—	—	4
Birkenhead	18	13	—
Birmingham, Central	169	266	—
,, Moseley Road	—	13	—
,, Vittoria Street	84	36	—
Bishops Stortford	—	47	—
Blackburn	41	1	6
Bolton	56	89	1
Bootle	—	1	—
Bournemouth, East	—	12	—
,, West	17	12	1
Bradford, Church Institute	16	—	—
,, Grammar School	—	13	—
,, Mechanics' Institute	15	1	1
,, Technical School	119	63	1
Brentwood	—	1	—
Bridgwater	18	36	—
Bridport	15	—	—
Brighton	166	230	5
Brimscombe	23	62	—
Bristol, Kensington House	15	13	1
,, Queen's Road	15	—	—
Brockley (Kent)	—	2	—
Bromley	27	13	—
Bromsgrove	17	62	—
Burnley	15	29	7
Burslem	137	54	1
Burton-on-Trent	83	125	1
Bury	—	87	—
Bury St. Edmunds	—	—	14
Camborne	14	13	1
Cambridge	16	21	—
Canterbury	33	38	10
Cardiff	—	13	2
Carlisle	16	13	—
Carmarthen	16	10	13
Chelmsford	97	309	14

Name of School or Class.	Objects.	Paintings, Drawings, and Photographs.	Books.
Cheltenham	17	1	—
Chester	14	12	15
Chesterfield	17	13	1
Chichester	4	9	—
Chippenham	15	—	—
Chipping Campden	274	501	5
Cirencester	16	—	—
Coalbrookdale	22	64	1
Colchester	148	137	19
Colne	—	8	—
Coventry	61	25	—
Crewe	—	13	4
Croydon	73	51	14
Darwen	89	67	—
Denton	—	28	—
Derby	168	269	1
Devizes	16	—	—
Devonport	16	12	3
Dewsbury	—	12	1
Doncaster	—	—	3
Dorchester	17	—	—
Dover	106	20	9
Dudley School of Art	69	48	4
„ Education Committee	—	—	1
Durham	16	1	1
Ealing	20	18	7
Eastbourne	199	45	—
Exeter	—	31	—
Farnham	70	24	10
Fenton	—	—	5
Folkestone	22	3	—
Gainsborough	—	7	—
Gloucester	16	—	4
Godalming	—	65	1
Gravesend	17	—	—
Great Grimsby	—	40	3
Guernsey	34	213	—
Halifax	16	13	1
Handsworth	19	13	1
Hanley	50	100	3
Harrogate	14	—	5
Harrow	—	7	—
Hastings	38	79	3
Henley-on-Thames	—	—	4
Hereford	16	13	—
Hertford	16	2	1
Heywood	—	13	—
High Wycombe	39	89	5
Hornsey	15	20	3
Horsham	—	4	—
Huddersfield	53	1	—
Hull	113	26	—
Hyde	—	43	—

Name of School or Class.	Objects.	Paintings, Drawings, and Photographs.	Books.
Ilkley	15	—	—
Ipswich	104	56	4
Keighley	17	1	1
Kendal	16	—	—
Kidderminster	17	17	1
Kingston-on-Thames	134	43	11
Lancaster	24	1	—
Leamington, Parade	17	—	—
„ Warwick Street	14	—	—
Leeds, Mechanics' Institute	26	33	1
Leek	83	74	6
Leicester, Municipal School	149	158	9
„ Wyggeston Hospital	16	—	—
Leighton Buzzard	14	—	1
Leominster	182	63	—
Lewes	16	20	3
Leyton	38	35	—
Lincoln	17	4	3
Liscard	—	13	10
Liskeard	16	—	—
Liverpool, Mount Street	—	1	—
„ South District	16	—	1
LONDON:			
Aldgate	187	311	—
Battersea	185	69	4
Bethnal Green (Globe Road)	9	11	—
Birkbeck Institute	16	25	8
Blackheath	73	28	10
Bolt Court	58	116	2
Borough Polytechnic	34	27	—
Camberwell	206	300	10
Camden	142	465	15
Chelsea	7	10	6
Clapham	34	116	22
Clapton	80	22	—
Clerkenwell	311	259	4
Hackney	16	—	1
Hammersmith	166	283	4
Highbury	16	—	—
Holborn, Royal Female School of Art	34	13	1
„ Working Men's College	—	28	—
Islington	16	—	—
Kingsland	16	—	—
Lambeth	16	—	—
Mile End	14	—	—
New Cross	—	12	6
Paddington	17	9	—
Putney	91	134	6
Regent Street, L.C.C.	153	22	—
„ Polytechnic	17	7	1
St. Charles' Training College	—	13	—
St. Mark's College	—	2	—
St. Martin's	27	—	3
Shoreditch	31	55	—
South Kensington:—			
Royal College of Art	565	360	4
School of Art Woodcarving	6	—	—
Wandsworth, Technical Institute	12	45	—
„ Convent of Sacred Heart	—	2	—
Waterloo	33	24	—
West London	16	—	—
Westminster	37	72	4

Name of School.	Objects.	Paintings, Drawings, Photographs.	Books.
Longton	—	30	1
Loughborough	—	—	8
Lowestoft	17	27	6
Lydney	—	12	—
Macclesfield	16	1	4
Maidenhead	175	105	13
Maidstone	—	13	1
Malvern	28	14	—
Manchester, Cavendish Street	19	1	—
„ Grammar School	32	18	—
„ School of Technology	60	172	—
Mansfield	16	—	—
Margate	15	23	4
Middlesbrough	—	5	—
Morecambe	32	21	—
Nelson	—	18	1
Newark	16	—	—
Newbury	11	—	—
Newcastle-under-Lyme	—	13	—
Newcastle-upon-Tyne	23	32	—
Newport (Mon.)	—	50	—
Northampton	15	24	1
Northwich	—	12	—
Norwich	66	85	—
Nottingham	17	13	1
Oldham	16	13	1
Oxford, School of Art	—	1	9
„ High School for Girls	—	4	—
Padiham	—	48	—
Penzance	61	14	—
Peterborough	16	62	10
Plymouth, Technical School	38	13	—
„ Westwell Street	16	—	1
Poole	15	1	—
Portsmouth	—	1	4
Preston	30	12	6
Reading College	99	31	5
„ School of Art	7	15	7
Redditch	17	—	—
Redhill	31	104	10
Redruth	15	—	3
Richmond	6	4	—
Rochdale	18	3	1
Rochester	93	92	6
Rotherham	15	1	1
Rugby	—	2	—
St. Albans	19	13	—
St. Helens	—	—	1
Salford	16	13	3
Salisbury	16	54	—
Sandringham	16	71	1
Scarborough	16	13	—
Selby	15	—	2

Name of School.	Objects.	Paintings, Drawings, Photographs.	Books.
Sheerness	—	42	—
Sheffield	320	128	1
Shrewsbury	21	35	3
Shipley	194	65	—
Sleaford	15	—	—
Southampton	17	19	—
Southend	—	47	1
Southport	16	13	3
South Shields	18	13	—
Stafford	17	23	1
Stockport	15	19	1
Stoke-upon-Trent	17	13	1
Stourbridge	15	—	—
Stratford	15	—	—
Stratford-upon-Avon	29	72	—
Street	11	37	—
Stroud	16	13	1
Sunderland	17	13	1
Surbiton	98	17	—
Swansea	—	—	1
Swindon	—	13	5
Taunton	18	19	3
Teignmouth	36	22	13
Tiverton	66	37	—
Tonbridge	143	68	—
Torquay	16	59	3
Tottenham	—	22	—
Truro	17	3	—
Tunbridge Wells	171	160	16
Tunstall	16	11	—
Wakefield	—	1	—
Walkden	—	37	—
Walsall	111	58	12
Walthamstow	16	29	—
Warminster	16	—	—
Warrington	121	44	—
Watford	13	1	—
Wath-on-Deane	—	3	—
West Bromwich	204	78	8
West Ham	19	44	—
West Hartlepool	15	—	6
Weston-super-Mare	16	—	7
Weymouth	16	—	—
Wigan	—	—	7
Wimbledon	181	105	10
Wimborne	—	—	3
Winchester	71	45	1
Winsford	—	12	1
Wisbech	31	2	—
Wolverhampton	17	—	—
Woolwich	143	184	—
Worcester	45	19	1
Wordsley	—	—	3
Wrexham	—	10	—
Yarmouth	14	12	—
York	60	13	—
Total English	10,539	10,418	672

Name of School.	Objects.	Paintings, Drawings, Photographs.	Books.
SCOTCH SCHOOLS, ETC. :—			
Aberdeen	16	47	—
Alloa	26	52	4
Dumbarton	17	—	2
Dundee High School	17	—	—
,, Technical School	15	—	1
Dunfermline: Public Library	16	213	—
,, Technical School	—	1	—
Edinburgh School of Art	9	—	—
,, Royal Scottish Museum	—	—	2
Elgin	—	—	5
Falkirk	18	13	—
Glasgow, Athenæum	17	—	—
,, Haldane Academy	18	1	1
,, Renfrew Street	227	39	—
,, Thomson Street	16	—	—
,, Weaving College	86	—	—
Greenock	—	—	9
Hawick	16	—	—
Inverness	—	—	9
Leith	—	40	5
Paisley	17	9	—
Perth	17	1	—
Stirling	—	12	—
Total Scotch	548	428	38
IRISH SCHOOLS, ETC. :—			
Belfast	13	689	—
Cork	14	1	—
Drogheda	—	1	—
Dublin: Met. School of Art	320	221	2
,, Dept. Agriculture for Circ. in Ireland	—	229	—
Galway	—	1	7
Kenmare	15	—	—
Limerick	17	1	—
Londonderry	31	—	—
Louth	13	10	—
Waterford	17	—	—
Total Irish	440	1,153	9
Grand Total		24,245	

(3.) Summary of Museums, Exhibitions, Schools of Art and Art Classes, &c., to which Objects have been lent during the Year 1907.

Museums	93	Number of objects, &c. lent		23,767
Exhibitions	27	„	„	2,833
Schools of Art and Art Classes	306	„	„	24,245
Lectures, &c.	7	„	„	330
		Lantern Slides		3,328
Total	433			54,503

Return of Provincial Museums to which Aid was granted for the purchase of Works of Art and Scientific Objects.

Name of Museum.	No. of Objects.	Description of Objects.	Aid by the Board. £ s. d.	Total Cost. £ s. d.
Accrington	—	Reproductions of Greek coins	35 0 0	70 0 0
Belfast	51	Irish antiquities	6 0 0	23 10 6
Bolton	88	Botanical and Biological specimens	47 6 10	96 8 6
Bootle	1	Natural History group	7 10 0	25 0 0
Bristol	78	Glass and Pottery, and Biological specimens	63 5 0	126 10 0
Camberwell	13	English works of Art	10 3 0	20 6 0
Cardiff	50	Pottery, Metalwork and Natural History specimens	96 3 1	192 6 3
Carlisle	3	Reproductions of British gold objects	5 5 0	10 10 0
Chelmsford	—	Natural History specimens	50 0 0	120 0 0
Dundee	87	Reproductions of Sculpture and Italian medals	74 7 6	148 7 6
Exeter	38	Natural History specimens	47 10 0	102 9 4
Glasgow	—	Enamels, Pottery, &c.	280 0 0	607 15 0
Hanley	97	English Pottery	83 3 6	166 7 0
Hull	36	Roman and Anglo-Saxon objects	8 0 0	35 0 0
Ipswich	63	Furniture and Pewter	21 11 0	43 2 0
Manchester, University Museum	29	Natural History and Botanical specimens	22 0 3	44 0 11
Middlesbrough	7	Casts of Geological specimens	5 16 3	11 12 6
Nottingham	24	Lace	40 14 9	81 9 6
Plymouth	136	Metalwork, Woodcarving and Pottery	83 15 0	167 10 0
Preston	25	Reproductions of Bronzes, copies of Cartoons and stained Glass	246 7 10	492 15 9
Salford	23	Casts of Sculpture	47 0 10	94 1 8
Sheffield	23	Metalwork, Pottery and Geological specimens	35 19 6	76 8 0
Stockport	16	Botanical and Biological specimens	5 1 0	10 2 0
Stoke-upon-Trent	10	English Pottery	7 0 3	14 0 6
Sunderland	1	Cast of Bronze statue	32 10 0	65 0 0
Truro	117	Fictile Ivories and photographs of Furniture	12 8 6	24 17 1
Warrington	92	Pottery, Embroidery and Metalwork	17 3 3	34 6 6
Worcester	—	Natural History specimens	5 4 0	10 8 0
	—	Total £	1,396 6 4	2,914 4 6

RETURNS OF ATTENDANCES AND RECEIPTS

(*a*) *Victoria and Albert Museum.*

(1.) Return of Monthly Attendance of Visitors.

1907.	Free Days.		Students' Days.	Sundays.	Totals.	Corresponding Totals in			
	Morning.	Evening.				1906.	1905.	1904.	1903.
January -	31,520	8,065	21,858	3,641	65,084	71,813	68,039	70,733	60,510
February -	28,997	7,895	13,722	7,786	58,400	53,986	53,541	57,675	54,703
March - -	36,491	8,708	16,921	11,718	73,838	65,929	68,037	65,205	65,208
April - -	63,457	12,102	13,060	10,671	99,290	92,326	110,901	104,288	98,408
May - -	52,461	10,942	17,171	9,721	90,295	61,842	64,135	85,211	60,937
June - -	32,642	8,540	17,979	11,364	70,525	70,139	82,511	58,623	72,187
July - -	39,168	9,478	24,572	9,152	82,370	71,073	70,410	72,332	74,752
August - -	58,207	12,970	42,230	10,091	123,498	103,109	111,636	99,770	109,549
September -	34,057	8,869	19,074	11,820	73,820	68,017	73,083	67,131	73,336
October - -	38,159	8,236	17,377	7,577	71,349	72,927	64,440	59,950	63,773
November -	28,899	7,597	12,008	4,675	53,179	54,920	51,914	48,009	58,373
December -	43,732	7,053	8,108	4,772	63,665	57,665	59,553	60,042	65,207
Totals -	487,790	110,455	224,080	102,988	925,313	843,746	878,200	848,969	856,943

(2.) Comparative Statement of Yearly Attendance of Visitors to the Museum from 1903 to 1907.

Year.	Total for the Year.	Average Monthly Attendance.		Total Monthly Average.
		Free Days, Morning & Evening.	Students Days.	
1903 - - - -	856,943	55,759	15,653	71,412
1904 - - - -	848,969	54,959	15,788	70,747
1905 - - - -	878,200	52,919	20,264	73,183
1906 - - - -	843,746	53,310	17,002	70,312
1907 - - - -	925,313	58,436	18,673	77,109

Total since the opening of the Museum on 22nd June, 1857, 44,880,849.

(3.) Attendance of the Public during Holidays in the past Five Years.

Year.	Easter.		Whitsuntide.		First Monday in August.	Christmas.	
	Easter Monday.	Easter Week.	Whit Monday.	Whitsun Week.		Boxing Day.	Christmas Week.
1903 -	15,724	48,730	6,704	23,448	11,080	6,808	29,529
1904 -	16,855	48,701	9,875	34,821	7,615	4,864	28,090
1905 -	16,285	51,137	17,119	37,560	10,099	6,895	23,796
1906 -	9,996	39,264	9,562	24,831	7,844	3,596	15,755
1907 -	11,380	39,902	14,396	39,860	8,766	5,344	19,997

(4.) Return of Receipts.

——	1903.	1904.	1905.	1906.	1907.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Admission fees -	462 16 0	461 8 6	447 6 0	461 2 0	530 10 6
Periodical tickets	77 3 6	78 1 0	82 17 0	73 5 6	74 13 6
Waiting rooms -	31 16 11	30 11 1	24 18 6	23 18 10	24 7 0
Totals - -	571 16 5	570 0 7	555 1 6	558 6 4	629 11 0

(*b*) *Bethnal Green Branch Museum.*

(1.) Return of Monthly Attendance of Visitors.

1907.	Week-days.		Sundays.	Totals.	Corresponding Numbers in			
	Morning.	Evening.			1906.	1905.	1904.	1903.
January -	29,653	11,198	1,849	42,700	45,196	39,707	47,444	36,936
February -	17,533	10,966	4,877	33,376	31,894	30,286	37,125	31,714
March -	17,411	9,410	10,715	37,536	40,789	36,334	41,878	39,436
April -	21,427	9,692	7,120	38,239	46,708	50,126	47,521	45,119
May -	21,233	7,812	7,232	36,277	32,142	31,475	41,140	31,613
June -	14,942	6,953	9,249	31,144	31,860	33,012	27,486	30,677
July -	20,614	6,643	7,184	34,441	29,299	29,358	34,025	29,715
August -	26,905	7,915	6,734	41,554	44,419	45,775	43,282	42,851
September	13,294	8,521	7,704	29,519	36,252	30,435	29,982	25,088
October -	18,632	7,433	3,969	30,034	36,479	32,021	28,527	27,955
November -	16,682	6,709	1,419	24,810	26,001	27,027	22,570	22,139
December -	24,739	7,328	1,670	33,737	32,810	36,203	41,157	15,179
Totals -	243,065	100,580	69,722	413,367	433,849	421,759	442,137	378,422

Total since the opening of the Museum on the 25th June, 1872, 18,133,467.

(2.) Attendance of the Public during Holidays in the past Five Years.

Year.	Easter.		Whitsuntide.		First Monday in August.	Christmas.	
	Easter Monday.	Easter Week.	Whit Monday.	Whitsun Week.		Boxing Day.	Christmas Week.
1903 -	5,978	20,605	4,454	12,788	3,969	3,078	17,156
1904 -	5,934	22,281	5,059	14,882	3,843	2,937	19,866
1905 -	6,346	21,756	5,415	13,168	4,087	3,138	13,660
1906 -	4,899	17,780	4,522	11,402	3,176	1,995	8,905
1907 -	3,800	15,434	4,617	14,051	2,962	3,478	10,052

(3.) Return of Receipts.

Year	1903.	1904.	1905.	1906.	1907.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Waiting rooms -	3 12 5	3 13 2	3 5 11	3 19 1	1 15 8

THE ROYAL COLLEGE OF SCIENCE, LONDON, WITH WHICH IS INCORPORATED THE ROYAL SCHOOL OF MINES.

THE ROYAL COLLEGE OF SCIENCE, LONDON, WITH WHICH IS INCORPORATED THE ROYAL SCHOOL OF MINES.

REPORT FOR THE SESSION 1906–7.

The usual meeting for the distribution of prizes and certificates won in the preceding Session took place on Thursday, October 4th, 1906. Professor Thorpe, C.B., F.R.S., formerly Professor of Chemistry in the College, and now Principal of the Government Laboratories, presented the awards and gave an address. Professor W. Ostwald, of Leipzig, was also present and addressed the students.

The most important events of the year have been, first, the transfer of the divisions of Physics and Chemistry to the new buildings, which they occupied from the beginning of the Session; and, secondly, the grant of a Charter to the Imperial College of Science and Technology, of which the Royal College of Science and the Royal School of Mines are henceforth to form integral parts.

In consequence of the removal of the divisions of Physics and Chemistry from the old building increased accommodation has been provided in that building for the divisions of Mechanics, Botany, Zoology and Metallurgy which remain behind. The arrangements made can be regarded, however, as only temporary in view of the developments contemplated in the establishment of the Imperial College under the new Governing Body.

The following tabular statement gives the number of students under instruction during the Session 1906–7, *i.e.*, from 4th October, 1906, to 29th June, 1907.

Subjects.		Associateship Students.						Occasional Students.			Grand Total.	Individual Students.
		National Scholars.	Royal Exhibitioners.	Local Exhibitioners.	Free Students.	Fee-paying Students.	Total.	Students in Training for Teachers.	Fee-paying Students.	Total.		
Mechanics	1st term	17	10	6	4	27	64	9	—	9	73	73
	2nd term	5	5	—	1	—	11	5	—	5	16	
Mathematics		42	16	11	9	25	103	14	7	21	124	124
Physics	1st term	8	1	2	—	—	11	10	—	10	21	98
	2nd term	28	7	6	6	27	74	16	8	24	98	
Chemistry	1st term	30	8	5	23*	35	101	13	4	17	118	121
	2nd term	8	2	1	17	4	32	7	4	11	43	
Biology	1st term	9	—	—	—	—	9	6	—	6	15	16
	2nd term	6	—	—	—	—	6	5	1	6	12	
Geology	1st term	1	—	—	—	1	2	4	—	4	6	73
	2nd term	16	5	6	3	30	60	9	3	12	72	
Metallurgy	1st term	1	1	—	—	29	31	3	8	11	42	49
	2nd term	1	1	—	—	7	9	3	8	11	20	
Mining		—	—	—	—	26	26	5	4	9	35	35

* Includes Inland Revenue and Customs students.

Total number of individual students - - - 303

Of which—Government students - - - - 176
Fee-paying students - - - - 127

The amount received for fees during the Session was £2,817

Number of Science teachers who received instruction during July, 1907.

	Number who attended.
Chemistry	18
Metallurgy	7
Physics	14
Astronomical Physics	11
Practical Mathematics	34
Mechanics of Building Construction	20
Vegetable Physiology	13
Total	117

MECHANICS AND MATHEMATICS—PROFESSOR J. PERRY, D.Sc., LL.D., F.R.S.

Mechanics, Part I.—The courses of lectures, numerical and other exercise work, laboratory work, and machine drawing, extended from October, 1906, to February, 1907, and were attended by 59 students. All of these entered for the final examinations, of whom 30 passed in the first class and 24 in the second class.

Mechanics, Parts II and III.—This course extended from October, 1906, to June, 1907, and consisted of lectures, numerical and other exercise work, laboratory work, and machine drawing. Eleven students attended the course, and at the final examinations 8 passed in the first class and 2 in the second class.

Graphics and Practical Geometry.—This course consisted of general graphical work in the first term, and practical solid geometry in the second term. It was attended by 65 students, all of whom entered for the final examination; 39 passed in the first class and 19 in the second class.

The prize for the best student in mechanics was awarded to Mr. Harry Whittaker.

At the end of the Session 9 students obtained the Associateship in Mechanics, 7 in the first class and 2 in the second class.

Summer Course.—During July, 1907, a course in Practical Mathematics was attended by 36 Science teachers. Lectures were given by the Professor to the general class, and also lectures of a more advanced character to a select number of students. These were illustrated by examples worked out in class under the supervision of Mr. Wrigley and the junior assistants.

Mathematics.—The classes were attended in all by 124 individual students, and at the examinations 87 qualified in Class A, 33 in Class B, 31 in Class C, 12 in Class D, and 11 in Class E.

The prize for the best student in Mathematics was awarded to Mr. Harold Talbot.

PHYSICS—PROFESSOR H. L. CALLENDAR, M.A., LL.D., F.R.S.

Physics, Part I.—This course was attended by 98 students, of whom 74 presented themselves for examination. Of these, 16 were placed in the first class and 52 in the second. Five failed in theory only, and one in both theory and practical. Nine students who had failed on previous occasions were re-examined, of whom 6 failed either in theory or practical.

Part II.—This course was attended by 15 students, all of whom entered for the final examination. Of these, 6 were placed in the first class and 9 in the second.

New Buildings.—Some progress has been made in the equipment of the New Buildings for post-graduate and research work, but owing to the state of uncertainty consequent on the transfer of the School from the Board of Education to the New Governing Body, many of the larger schemes have been delayed. The equipment for the ordinary teaching of Parts I and II has been for some time practically complete, but the extra work involved in refitting all the apparatus for the lectures and practical work has left little or no time for research.

Research.—Prof. Callendar, in conjunction with Prof. Dalby, carried out a series of measurements of temperature in the cylinder of a gas-engine at the laboratory of the Central Institution. Assistant Prof. Watson has continued his researches on the Petrol Motor, with the aid of special types of Indicator constructed in the College workshop. Assistant Prof. Fowler has continued his investigations on the spectra of metals in relation to the spectrum of sun-spots, and of the chromosphere. Mr S. W. J. Smith has continued his researches on the magnetic properties of nickel and iron alloys, and on electrocapillarity. Messrs. Brinkworth and Swan have carried out electrical measurements of the latent heat of steam, and the specific heats of gases, respectively. The following papers have been published :—

On the Measurement of Temperatures in the Cylinder of a Gas-Engine, by Prof. H. L. Callendar, and Prof. W. E. Dalby. Proc. R.S. A. 80., p. 57.

The Thermomagnetic Analysis of Meteoric and Artificial Nickel-Iron Alloys, by S. W. J. Smith, M.A., A.R.C.S. Phil. Trans. A. 208, pp. 21–109.

Enhanced Lines of Iron in the Region F to C, Note on Silicon in the Chromosphere, and The Origin of Certain Bands in the Spectra of Sun-spots, by Prof. A. Fowler. Monthly Notices, R.A.S. 67., pp. 154, 157 and 530.

The fluted Spectrum of Titanium Oxide, Prof. Fowler. Proc. R.S. 79, p. 509.

Chemistry—Professor W. A. Tilden, D.Sc., F.R.S.

The instruction in this division consisted of :—

(1.) A course of about 70 lectures on inorganic chemistry, and the principles of chemical philosophy, extending from the beginning of October to the middle of February, delivered to students in their first year by Professor Tilden.

(2.) A course of 30 lectures on physical and theoretical chemistry, extending from the end of October to the end of January, delivered to students in their second or third year by Dr. J. C. Philip.

(3.) A course of 12 lectures on the theory of analysis, extending from the end of October to the end of January, delivered to students in their first year by Dr. G. T. Morgan.

(4.) A course of 30 lectures on elementary organic chemistry, extending from the middle of February to the beginning of June, delivered to students in their first or second year by the Assistant Professor, Dr. M. O. Forster.

(5.) A course of 60 lectures on organic chemistry, extending from the middle of February to the beginning of June, delivered to students in their second or third year by Dr. M. O. Forster.

In addition to the foregoing courses, frequent lectures and demonstrations on the principles underlying qualitative and quantitative analysis were given in the laboratories, and classes for instruction in chemical arithmetic were also held.

The number of students receiving instruction in Chemistry during the session was 118 in the first term and 43 in the second term. The numbers in the different categories of students are shown on page 58.

The conduct and diligence of the students in all the classes have been satisfactory.

A course of lectures and, in the summer term, 12 lessons were given in photographic methods, by Mr. H. Chapman Jones.

Research Laboratories.—Mr. W. Godden worked on the condensation products from pinene aminodicarboxylic acid. Dr. G. Austerweil, of Zürich University, devoted three months to the chemistry of camphane and certain of its derivatives. Mr. E. Cahen and Mr. J M. Hird were associated in studying the separation of antimony from tin. Miss Bryan investigated the action of chlorine upon alkalis. Mr. G. S. Whitby was engaged in attempts to prepare organo-boron compounds. Mr. A. Clayton made a study of numerous oxonium salts. Mr. T. Jackson prepared camphoryldithiocarbamic acid, and investigated several derivatives arising therefrom. Mr. H. Holmes inquired into the action of diazomethane upon isonitrosocamphor and allied substances. Miss H. Judd studied some derivatives of the barbituric acid type. Miss W. Smith made experiments on the estimation of rubber in plants. Mr. J. W. Shepherd investigated a rubber latex from Borneo. Mr. J. F. Stansfield occupied two months in the examination of certain thio-derivatives of camphor. Dr. J. C. Philip was engaged in working out a theory of the hydration of dissolved substances, and in connection with this theory determined the density of a number of solutions. Mr. H. R. Courtman was engaged on a study of the hydrates of sulphanilic acid, and on a determination of their vapour tensions. Mr. W. Trotter was at first occupied with some experiments on the refractive power of mixed liquids, and later on made a preliminary investigation into the distribution of hydrogen peroxide between amyl alcohol and aqueous salt solutions.

The following papers, containing the results of experimental work performed in the chemical laboratories, were published during the session :—

The Preparation and Properties of Dihydropinylamine (Pinocamphylamine). By W. A. Tilden and F. G. Shepheard. Trans. Chem. Soc., 1906, 1560.

The Aminodicarboxylic Acid derived from Pinene. By W. A Tilden and D. F Blyther. Trans. Chem. Soc., 1906, 1563

Pinene Nitrolamine. By F. P. Leach. Trans. Chem. Soc., 1907, 1.

A Pseudo-Semicarbazide from Pinene. By F. P. Leach. Trans. Chem. Soc., 1907, 10.

Influence of Substitution on the Formation of Diazo-amines and Aminoazo-compounds. Part VI. The Partially Methylated 4 : 6 Diamo-m-xylenes. By G. T. Morgan and F. G. Micklethwait. Trans. Chem. Soc., 1907, 360.

New Cerium Salts. By G. T. Morgan and E. Cahen. Trans. Chem. Soc., 1907, 475.

The influence of Non-electrolytes and Electrolytes on the Solubility of Sparingly Soluble Gases in Water. The Question

of Hydrates in Solution. By J. C. Philip. Trans. Chem. Soc., 1907, 711; Trans. Faraday Soc., 1907; Vol. 3.

Aromatic Azoimides. Part I. Parahydroxyphenylazoimide. By M. O. Forster and H. E. Fierz. Trans. Chem. Soc., 1907, 855.

Studies in the Camphane Series. Part XXIII. Oximes of Camphorylsemicarbazide and Camphorylazoimide. By M. O. Forster and H. E. Fierz. Trans. Chem. Soc., 1907, 867.

A series of Coloured Diazo-salts derived from Benzoyl. 1 : 4-Naphthylenediamine. By G. T. Morgan and W. O. Wootton. Trans. Chem. Soc., 1907, 1311.

Studies in the Barbituric Acid. Series I. 1 : 3-Diphenylbarbituric Acid and some Coloured Derivatives. By M. A. Whiteley. Trans. Chem. Soc., 1907, 1330.

Aromatic Azoimides. Part II. Ortho- and Meta-hydroxy phenylazoimides. By M. O. Forster and H. E. Fierz. Trans. Chem. Soc., 1907, 1350.

The Diazo-derivatives of Benzenesulphonylbenzidine. By G. T. Morgan and J. M. Hird. Trans. Chem. Soc., 1907, 1505.

The Interactions of Aromatic Amines and para Diazoimides. By G. T. Morgan and F. G. Micklethwait. Trans. Chem. Soc., 1907, 1512.

Recent experimental work on Osmotic Pressure. By J. C. Philip. Sci. Prog., 1907, No. 4.

The Analytical Laboratory was under the charge of Dr. G. T. Morgan, who was assisted in teaching the more advanced students by Mr. H. Chapman Jones and Dr. J. C. Philip. The Junior Staff was as follows :—Mr. F. P. Leach, B.Sc., succeeded in April by Mr. J. M. Hird, B.Sc., Mr. W. O. Wootton, B.Sc. (junior demonstrators), Mr. J. M. Hird, B. Sc., succeeded in April by Mr. E. Cahen, Mr. G. S. Whitby, B.Sc. (students in training), Mr. Taylor Cook, Assoc.R.C.S., Mr. W. Trotter, Assoc.R.C.S. (teaching scholars).

During the winter term the total number of students in the laboratory was 117, of which 98 took the course for Part I, the remainder being occupied with more advanced work.

During the summer term 40 students remained, being occupied chiefly with quantitative analytical work.

The Physico-Chemical Laboratory was under the charge of Dr. J. C. Philip, who received occasional assistance from one of the junior staff.

The Organic Chemistry Laboratory was under the charge of Dr. M. O. Forster, assisted by Dr. M. A. Whiteley, and Mr. W. Taylor Cook, B.Sc. (student in training). Twenty-six students worked in this laboratory during the year, in groups so arranged that each student was occupied during about 10 weeks in practical exercises dealing with the preparation, analysis, and identification of carbon compounds.

Photographic Department.—The new rooms were under the charge of Mr. Chapman Jones, who gave a short course of lectures on photographic apparatus and methods. A small number of students, also received practical instruction, but the dark room accommodation was incomplete and full use could not be made of it till the session was over.

The Summer Course for Teachers, in July, was conducted in the Analytic Laboratory, under the direction of Dr. M. O. Forster, assisted by Dr. J. C. Philip, Mr. W. O. Wootton, B.Sc., Mr. E. Cahen. Mr. J. M. Hird, and Mr. G. S. Whitby. Seventeen teachers attended, and worked principally at qualitative and quantitative analysis, and various volumetric and gasometric operations adapted to their previous experience. Dr. Forster delivered a course of six lectures on "The application of metals to chemical synthesis."

Zoology.

The temporary arrangements made for the session 1905–6 were continued through that of 1906–7, zoology classes being again placed in the charge of Professor Dendy, with Mr. Darbishire as Demonstrator.

Six students attended the Elementary Lectures and Laboratory, of whom three obtained a first class and three seconds in the examination.

One student took the advanced lectures and laboratory and obtained a first class in the examination.

Mr. Hindle was appointed student assisting in teaching and was also engaged in research work with Professor Dendy, the results being embodied in a memoir on the New Zealand Holothurians, published by the Linnean Society (some additions to our knowledge of the New Zealand Holothurians. By Arthur Dendy and E. Hindle, Linnean Society's Journal, "Zoology," Vol. XXX., October, 1907).

Mr. Hindle has since received an appointment in the Liverpool School of Tropical Medicine.

Mr. Thacker was also engaged in research work on a collection of calcareous sponges from the Cape Verde Islands.

Mr. W. S. Rowntree spent some weeks in the laboratory in investigations upon fishes.

A new advanced laboratory, research laboratory, museum, etc., have been fitted up on part of the floor previously occupied by the chemical department, and the greater part of the zoological teaching collection has been removed to a well lighted room on this floor.

Botany—Professor J. B. Farmer, D.Sc., F.R.S.

The elementary class was attended by seven students, of whom six sat for the terminal examination, two being placed in the first class.

Eleven students were working in the advanced and research laboratories. Four sat for the final examination, two being placed in the first class.

The Demonstrator, Mr. McRae, having obtained the post of Supernumerary Mycologist at the Imperial Agricultural Institute at Pusa, under the Government of India, Mr. M. Wilson, B.Sc., a former student who had been Junior Demonstrator in the University of Glasgow, was appointed to fill the post thus vacated by Mr. McRae.

Mr. A. Horne has continued his researches on the "Morphology and Classification of the Cornaceæ with special reference to *Davidia involucrata*." This investigation has been finished, and the results are now ready for publication. He has been appointed, during the session, Senior Demonstrator in Botany at the Armstrong College, Newcastle-on-Tyne.

The following original memoirs have been published, as the resu of work done in the Laboratory :—

Farmer, J. B. On "The structural constituents of the Nucleus, and their relation to the Organisation of the Individual." Proc. Roy. Soc., Vol. LXXIX. (Croonian Lecture).

Farmer, J. B. Presidential Address to Section K of the British Association, 1907.

Farmer, J. B., and Digby, L. Studies in Apospory and Apogamy in Ferns. Annals of Botany, Vol. XXI.

Farmer, J. B. On "'Bitter Pit' in Apples." "Kew Bulletin," 1907.

Gibbs, L. S. A contribution to the Botany of Southern Rhodesia. Journ. Lin. Soc., Vol. XXXVII.

Gibbs, L. S. Notes on "The Development and Structure of the Seed in the Alsinoideal." Annals of Botany, Vol. XXI.

Owing to the increased space which has been placed at the disposal of the Division, it has been possible to partly rearrange the teaching collections so as to make them more accessible and useful to students.

GEOLOGY—PROFESSOR W. W. WATTS, M.A., M.SC., F.R.S.

Of the Elementary students 40 took the course arranged for the Royal College of Science. Ten of these passed in the first class, 25 in the second, and 4 failed. One other student was re-examined and passed, and a second passed a special examination.

The students taking the course arranged for the students of the Royal school of Mines numbered 26; in the examination 3 of these passed in the first class, 20 in the second, 2 failed, and 1 qualified in Determinative Mineralogy for the diploma. One student was re-examined and passed.

The Murchison medal and prize of books was awarded to A. B. Middleton, of the School of Mines.

The classes in Part II. were attended by 4 students, all of whom were assisting in teaching. Thus Part III. was not taken at all during this session. All but one of these students sat for the examination and passed in the first class. The other took his degree in the University of London and obtained second class honours in Geology. Two occasional students attended for parts of the Part II. course.

The advanced lectures in Mineralogy were delivered by the Assistant-Professor, Dr. C. G. Cullis, those in Petrology by the Senior Demonstrator, Mr. R. F. Gwinnell, and those in Structural Geology by the Professor.

A week's field-work was carried out in Gloucestershire and Monmouthshire in the autumn and was attended by the advanced students and 3 former students of the School.

Help in Section Cutting was given to two or three teachers in other Institutions.

The staff in the Divisions during the session consisted of the following:— Dr. C. G. Cullis, the Assistant Professor; Mr. R. F. Gwinnell, the Senior Demonstrator; and Dr. A. Morley Davies as

Junior Demonstrator. T. Dewhurst, A. R. Walker, H. G. Smith, A. Wade, and A. E. V. Zealley acted as students in training assisting in teaching. Mr. T. Dewhurst was appointed at the beginning of the session 1906–7 as Lecturer and Demonstrator in Geology at Queen's College, Belfast. Mr. A. Morley Davies was awarded the degree of D. Sc. at London University for his Geological Researches.

The following scientific papers have been published, wholly or in part the result of work carried on in the Division :—

W. W. Watts. The Geology of Charnwood Forest. British Association Handbook.

C. G. Cullis. On a peculiarity in the Mineralogical Constitution of Keuper Marl. British Association, 1907.

C. G. Cullis and L. Richardson. Some Remarks on the Old Red Sandstone Conglomerate of the Forest of Dean. Proc. Cotteswold Naturalists' Field Club.

A. M. Davies. London's first Conduit System. Trans. London and Middlesex Arch. Soc.

A. Wade. The Chemical Composition of Igneous Rocks.

G. C. Gough. A Case of Metamorphism of Chalk.

The presents made to the Division during the session comprise the following :—

A large number of microscopic slides of rocks, presented by Professor J. W. Judd.

Maps by the Geological Survey of Italy and a Bulletin of the United States Geological Survey, by Professor Judd.

Bulletins of the Geological Society of the Nord and of Belgium, by Professor Judd.

Section of a tree containing 8·5 grains of gold to the ton, and specimens of Geological Maps of British Guiana by Professor J. B. Harrison.

Specimens of Rocks presented by H. M. Geological Survey of Scotland.

Specimen of Rocks, presented by G. Barrow, Esq.

Specimens of Atacamite, blende with gold, and a fine specimen of trilobites from the Tremadoc Rocks, by H. T. Butcher, Esq.

Gold-bearing and other rocks, by G. Fairbairn, Esq.

The Authorities of the Geological Survey kindly permitted Mr. R. F. Gwinnell to accompany a member of that Survey in his field work in the summer of 1907.

Metallurgy—Professor W. Gowland, Pres.Inst.M.M., A.R.S.M., F.S.A., F.I.C.

The number of students who attended the courses of instruction during the first term was 43, and during the second term 31.

During the first term Professor Gowland delivered 40 lectures, in addition to three dealing with Furnace Design and Building and a special demonstration, at which the students were required to set out with bricks to full working scale the foundations and various portions of the brickwork of a copper smelting furnace. The work of the

Laboratory was supplemented by 28 lectures by the Instructor-in-Assaying, dealing with the sampling of Ores, examination of Refractory Materials and the theory of Assaying. At the sessional examination held in February, 28 students presented themselves for the examination in Metallurgy, of whom 14 obtained a first class and 13 a second class, while one failed to satisfy the Examiners. In the examination in Practical Assaying there were 29 candidates, of whom 17 obtained a first class, and 12 a second class.

To the 31 students attending the Part II. Course, Professor Gowland gave 40 lectures, in addition to a special series of demonstrations in Furnace Drawing and Construction. Complete and detailed working drawings of a furnace, specially designed by the Professor, were made by the students.

During this term 30 lectures on Assaying, Metallography, Pyrometry, and Electro-Metallurgy, were given by Mr. W. H. Merrett. Two students were engaged in special investigations in the metallurgical laboratories during the session. The exact nature of the original work undertaken by them is given below.

During the second term the advanced class of Artillery Officers from the Ordnance College, Woolwich, attended a special course of instruction in iron and steel, in the Metallurgical Division. Twenty lectures were given by the Professor and were subsequently supplemented by visits to works in the Sheffield, Middlesbrough and Newcastle districts. This tour, which was conducted by the Professor, was, in addition to the class, accompanied by Colonel Townshend, R.A., P.A.C., the Commandant, and Professor Hodgkinson, Ph.D., of the Ordnance College.

The following officers attended this course:—Capt. B. A. Hill, Royal Marine Artillery; Capt. C. W. Scott, Royal Field Artillery; Capt. M. L. Wilkinson, Royal Garrison Artillery; Capt. K. Saigo, Imperial Japanese Artillery; Lieut. G. F. B. Turner, Royal Field Artillery; Lieut. S. C. Peck, Royal Garrison Artillery.

The practical work of the Laboratory was illustrated by nine lectures on pyrometry, metallography, testing machines, and on the physical metallurgy of alloys generally and steel in particular.

The officers attending the course eventually passed an examination, held by the Examiner in Steel to the Ordnance College, in an extremely creditable manner.

At the final examination in June, 14 candidates were examined in Metallurgy and Assaying, 7 of whom obtained the Associateship in the first class and 4 in the second class, while 3 failed to satisfy the examiners.

The Bessemer medal and prize of books were awarded to Mr. W. M. Cobeldick.

The Institution of Mining and Metallurgy Scholarship of £50 for this year was obtained by Mr. L. G. Campbell.

Post-Graduate Scholarships were awarded to Messrs. L. G. Campbell and E. B. Pollard to enable them to obtain practical experience in South Africa and the Kolar Goldfields of India respectively.

Research :—

Mr. A. E. Pratt, A.R.S.M., carried out some investigations on calcium alloys, for which he was subsequently awarded the B.Sc. degree (by Research), by the University of London, and also he read a paper on these alloys before the British Association at Leicester, which attracted considerable attention.

Mr. E. B. Pollard, A.R.S.M., conducted a research on the cyaniding of gold ores, for which he was awarded the Edward Matthey prize. Mr. Pollard's work included the testing of all the various methods known for the accurate estimation of gold in cyanide solutions, with a view to improvements in the methods of procedure. The results of his experiments are shortly to be embodied in a paper to the Institute of Mining and Metallurgy.

Papers read during 1906–7 :—

Mr. A. E. Pratt, A.R.S.M., British Association, 1907, "Calcium."
Mr. A. E. Pratt, A.R.S.M., Institute of Mining and Metallurgy, "The Ironstone of Cleveland."

Practical Work.—The following practical work was performed during the session in addition to the Elementary and Advanced Courses of Assaying :—

1. Furnace building.
2. Stamp milling of gold ores.
3. Extraction of gold from an ore by the cyanide process.
4. Testing the suitability of ores for the cyanide process.
5. Extraction of gold from concentrates by roasting and chlorination.
6. Chloridising roasting of silver ore.
7. Pan amalgamation of silver ore.
8. Electrolytic deposition of copper, both by revolving and fixed cathode methods.
9. Smelting lead and copper ores in makeshift furnaces, as used for prospecting purposes.
10. Smelting copper ores in the blast furnace for matte and running the matte for copper.
11. Calibration of a pyrometer and the estimation of various temperatures.
12. Photomicrography of metals, especially steel, after different forms of thermal treatment.
13. Mechanical testing of metals.
14. Hardening and tempering of steel.
15. Preparation and casting of alloys.

The usual annual metallurgical tour of the class to works in different parts of England and Wales, extended from the 4th until the 30th April, when, under the direction of the Professor, the following works were visited :—

1. The Ebbw Vale Steel, Iron and Coal Co., Ltd., Ebbw Vale, Monmouth.
2. The Glyn Neath Dinas Mines, Glyn Neath.
3. The Morfa Copper Works and Upper Bank Spelter Works, Swansea.
4. The English Crown Spelter Works, Swansea
5. The Cape Copper Works, Briton Ferry.
6. Bath's Ore Yards, Swansea.

7. The Dinas Firebrick and Cement Works, Neath.
8. The Rio Tinto Copper Co., Ltd., Port Talbot.
9. The Upper Forest and Worcester Steel and Tin Plate Works, Ltd., Morriston, Glamorgan.
10. The Llanelly Steel Works, Llanelly.
11. The Old Castle Iron and Tin Plate Co., Ltd., Llanelly.
12. The Tin and Metal Stamping Co., Ltd., Llanelly.
13. Green's Foundry Co., Aberystwyth.
14. The St. David's Gold Mines, Ltd., Bontddu, near Dolgelly.
15. The Ditton Copper Works, Ditton.
16. The Darwen and Mostyn Iron Co., Ltd., Mostyn, North Wales.
17. Walker, Parker & Co., Ltd., Lead Works, Bagillt.
18. The Brymbo Steel and Ingot Iron Works, Brymbo, near Wrexham.
19. The Sandycroft Foundry Co., Ltd., Sandycroft, near Chester.
20. Walter Scott, Ltd., Leeds Steel Works, Leeds.
21. The Farnley Iron Co., Ltd., near Leeds.
22. The North Eastern Steel Co., Ltd., Middlesbrough.
23. Bell Brothers, Ltd., Middlesbrough.
24. Bolckow, Vaughan and Co.'s Works, Middlesbrough.
25. The Cargo Fleet Iron Works, Middlesbrough.
26. The North Eastern Steel Works, Middlesbrough.
27. Huntsman's Crucible Steel Works, Sheffield.
28. The Park Gate Iron and Steel Co., Ltd., Park Gate Works Rotherham.
29. The Tinsley Steel, Iron and Wire Rope Works, Sheffield.
30. Thos. Firth and Sons' Norfolk Works, Sheffield.
31. John Brown and Co.'s Atlas Steel and Iron Works, Sheffield.
32. Cammell's Grimesthorpe Works, Sheffield.
33. Cammell's Cyclops Works, Sheffield.

The Professor again wishes to particularly record his appreciation of the kindness and courtesy extended to his class by the owners and managers of works throughout the tour, and for the special facilities which they afforded the students in examining the plant and processes in every case.

Teachers' Course.—The Summer Course was attended by 7 teachers, who, in addition to the usual metallurgical work, received special and individual instruction in photo-micrography and pyrometry. In all 10 lectures were given, 4 being devoted to metallography and pyrometry, 3 to iron and steel analysis, and 3 to sampling and special methods of assaying complex ores. Two visits were arranged in this course, the first to Woolwich Arsenal, including the testing laboratories, and the second to the National Physical Laboratory, where special demonstrations were given on the methods employed for obtaining differential cooling curves of alloys. Throughout the course the teachers displayed more than the usual interest and enthusiasm, especially with regard to Metallography.

The teaching of the division was, as usual, conducted with the assistance of teaching scholars. Messrs. F. K. Borrow, A.R.S.M., and B. Drinkwater, A.R.S.M., were appointed in October, but early in February the latter gentleman received an appointment as temporary Assayer at the Royal Mint, and was replaced by Mr. W. Cooper, A.R.S.M., who with Mr. Borrow remained until the end of the session.

MINING—PROFESSOR S. HERBERT COX, A.R.S.M., M.I.M.M.

The instruction in this division consisted of lecture courses and practical instruction.

Lecture Courses:—Professor Cox delivered 74 lectures in all, viz.:—

(*a*) A course of 14 lectures on Mineral Dressing to the combined Mining and Metallurgical Class of 32 students.

(*b*) A course of 60 lectures on General Mining to the Mining Class of 23 students.

Mr. Cooke delivered 58 lectures on Mine Surveying to a class of 30 students.

Dr. Percy Potter gave a course of 5 lectures and demonstrations on "First Aid to the Injured."

Practical Instruction:—

Preliminary instruction in field-work was given as usual by way of various surveying and levelling exercises in Hyde Park, the chief being:—

(*a*) Survey by the chain of an area of about 20 acres.

(*b*) Survey with the magnetic compass of an area of about 25 acres.

(*c*) Theodolite traverse of an area of about 60 acres, interior details being filled in with the aid of a circumferentor.

(*d*) Tacheometrical traverse and contouring of a strip of country followed by precise levelling.

The survey practice in Cornwall comprised:—

1. Preliminary Reconnaisance with Compass or Plane Table over the mine sett, which is about one square mile in area.
2. Triangulation of the part of the sett on which mining exploration and work has been carried on.
3. Traversing with the Miner's Dial through two underlie shafts, the three shallow adits, the deep adit, and the 30 and 40-foot levels. With the exception of one shallow adit none of the workings could be entered directly from the surface.
4. Connecting the surface triangulation with the deep adit by a theodolite traverse through the R.R. underlie shaft.
5. Theodolite traverse of the deep adit, which, with its branches, comprised a length of upwards of 3,000 feet. The adit was low, narrow and tortuous, and special methods of setting up the instruments had to be adopted, as there was no room even for the ordinary short tripod.
6. Connection of the adit traverse by tieing the survey to plumb lines in the adit shaft and in James' shaft, and making the necessary co-ordinate computations.
7. A similar connection was obtained by computation from the co-ordinates of the foot of the traverse of the underlie shaft and the co-ordinates of the plumb line in James' shaft.

8. Two plumb lines were hung in James' shaft, an interval between them of only 3·7 feet being possible. The shaft was very wet, and there was a considerable amount of air current in spite of a door being erected in the adit and the shaft being covered over at the collar. Consequently 60lb. plumb-bobs and No. 27 S.W.G. piano wires were used, the factor of safety of the wire being 1·2. Students practised two distinctly different methods of connecting on to the two plumb lines at the surface and underground, Weisbach's system and that of direct alignment being the two methods employed.
9. Stope measurements.
10. Observations for latitude.
11. Solar and stellar observations for azimuth.
12. Boundary traverse with the theodolite.
13. Running precise levels to surface traverse and triangulation stations as a basis for a tacheometrical survey.
14. Contouring the surface with the tacheometer.
15. Filling in the details of the triangulation survey on favourable ground with the chain only.
16. Minor traverses with the Circumferentor, etc., to pick up surface details.

The four methods of connecting and orienting the precise underground survey afforded a most excellent opportunity to the students of comparing the practical difficulties peculiar to each method.

Very satisfactory results were obtained by the various parties. The differences of orientation referred to a common draft underground exceeded two minutes of arc in one or two cases only. Such orientation results would be quite acceptable in actual practice.

The special thanks of the Board of Education are again due to the directors of the Tywarnehaile Syndicate, Ltd., for granting the use of the mine to the class.

During their stay at the mine the class had the opportunity of seeing the vertical high lift centrifugal pump working, and the Elmore Vacuum Concentrator also on its trial runs.

During the term the following gentlemen acted as assistants for different periods:—H. W. Faulkner, R. C. Munro, F. H. Nash, L. G. Ray, R. E. B. Vinicombe.

Results of Examinations.—The following table shows the number of students who attended the full course and the number (including re-examined students) who passed the examinations:—

Branch.	No. of Students in attendance.	Examinations.		
		No. of Candidates.	No. of Passes.	No. of Failures.
Mining - -	23	23	22	1
Ore Dressing -	32	32	30	2
Mine-Surveying-	36	30	27	3

The student's place in the class-list is finally determined on the basis of the marks obtained in the separate examinations in mining (including mineral dressing), mine surveying and assaying, and of those awarded him for his work during the session. A student must, however, obtain sufficient marks to qualify in each separate division of the subject before a certificate in mining can be awarded. The final results show that 7 passed in the first class, and 19 in the second class.

8 First Class and 18 Second Class Associateships were granted in Mining.

Mr. W. M. Henderson-Scott and Mr. E. D. Pope were each awarded a De la Bêche medal, and the Mining Prize presented by the Board of Education was divided between them. The Institution of Mining and Metallurgy also awarded to each a £50 Scholarship, Mr. F. C. Claudet having provided the funds for the second of these.

Post-Graduate Courses of practical work in mines were arranged under the auspices of the Institution of Mining and Metallurgy, and the following were the accepted candidates :—

De Beers Diamond Mines.—R. C. Munro.

Transvaal Mines.—L. G. Campbell, W. J. Howes, W. B. A. Sparks W. H. Miles, A. J. L. Pretorius, A. A. English.

Indian Mines.—R. G. Williams, A. W. Blandford, E. B. Pollard.

El Oro Mine, Mexico.—H. W. Faulkner.

Tomboy Mine, Colorado.—W. M. Henderson-Scott.

Broken Hill Mine, New South Wales.—E. D. Pope.

Boulder Perseverance Mine, West Australia.—E. J. Stacey.

Appointments.—The following past year's students have received appointments as under :—

E. H. A. Joseph in the Siamese Mint.

W. J. Weeks in the Mining Department, Siam.

G. W. Rudyard at the Cerro Muriano Mine, Spain.

E. L. Gay-Roberts in French Guinea.

F. B. Greenfield on the Tuspenssky Mine, Siberia.

THE ROYAL COLLEGE OF ART.

THE ROYAL COLLEGE OF ART.

Report for the Session 1906–7.

There were in the College 137 men and 60 women students, making a total of 197 as compared with 201 for the Session 1905-6. This number was made up as follows:—18 Students-in-Training, 32 Royal College of Art Scholars, 12 National Scholars, 20 Royal Exhibitioners, 17 Local Exhibitioners, 4 Junior Art Scholars, 38 Free Students, and 56 fee-paying Students.

The total amount received in fees was £775 11s., as compared with £884 18s. for the previous Session.

Architectural School.—The number of students was 50; 13 in the Upper Division, and 37 in the Lower Division.

The advanced students of the Upper School during the Session studied English Domestic Architecture from mediæval to modern times, combining a series of historical illustrations with designs in the various styles under review. Their attention was ultimately directed to the production of a design for a large country mansion suitable for a Prince's residence; complete freedom was encouraged in the student as to style and its adaptation to modern requirements. A group of the students devoted their attention to the subject set for the competition of the British Institution, which was a Town Residence, and Mr. H. L. Oakley, a student of the Upper School, was successful in obtaining the award of a Scholarship for two years.

The interest and enthusiasm among the students were well maintained throughout the Session.

The first term students of the Upper School studied the application of the Renaissance manner of design to a Pavilion for an International Exhibition, with the decoration of its vaulted *loggia* in colour, in order to undertake the application of colour to architecture upon historic lines. For this purpose studies were made from models in the Museum and from the valuable series of original drawings in the Art Library. The result of this study was a satisfactorily varied group of designs upon a similar basis.

Advantage was taken of facilities granted to the students by His Majesty's Office of Works, for making drawings of public buildings in charge of that office, and Architectural drawings were made of The Royal College of Science, The British Museum, The Tower of London, Hampton Court Palace, and Kensington Palace.

The students of the Lower School were occupied with the introductory course adapted for all students entering the College, which comprised the study of examples of Woodwork from the Victoria and Albert Museum, Mediæval Masonry and Italian Renaissance Ornament. Historical studies and measured drawing preceding in each case practical design. The large number of students working together promoted emulation in study and proved helpful to the more elementary students who had little previous acquaintance with architecture. With few exceptions the work of the Lower School students was very encouraging.

School of Design.—The number of students was 47; 31 in the Upper Division and 16 in the Lower Division.

Progress continued to be made along the lines detailed in reports of former years. The work undoubtedly gets stronger every year in consequence of the continuity. The course followed was based (1) on the study of practical requirements in which the Craft Classes are an immense, indeed, an essential aid; (2) on tradition, in which large use is made of the Museum; (3) on the study of nature, and lastly on experiment. Eccentricity has nearly disappeared from the designs of the students and some able men have been trained.

School of Painting and Mural Decoration.—The number of students was 38; 30 in the Upper Division and 8 in the Lower Division.

The work of the students in the Upper Division was principally devoted to the designing and carrying out of the decoration of a Board Room for a Coal Company; the dimensions of the room, positions of the windows, doors and fixtures were given, and the students were allowed to arrange their own scheme. The results were fairly satisfactory on the whole and the best panels were carried out full size; one scheme, however, was so good that a small model was made so that the sketches could be placed in relative positions. This latter was the most complete scheme that has yet been accomplished by students of the College.

The students of the Lower School produced a very good set of painted heads and some excellent compositions.

The monthly compositions made this year reached an exceptionally high level; attractive themes and continuous practice in designing for a given subject have both combined to bring about this gratifying result.

Modelling School.—The number of students was 40; 24 in the Upper Division and 16 in the Lower Division.

In the Upper Division 6 of the men students each executed remarkably good figures, life size, a bust from the life, a large decorative composition and studies of arrangements of drapery. The remaining male students did similar studies on a smaller scale.

Four of the women students each did excellent life-size studies from the life, as well as a bust from the life and a composition in the round and one in relief. The remaining female students executed a torso, life size, from the life, and compositions in the round and in relief on a small scale.

In the Lower Division the work consisted of studies of the features, a bust from the antique, a bust from life, a small figure from life, and decorative compositions involving the use of Architecture.

Mr. Doman, of the Upper Division, was awarded a British Institution Scholarship.

Literary Course.—The subjects for the monthly Figure Compositions were taken from the "Cycle of Cuchulain," which proved a very stimulating source of inspiration. As a foundation for these compositions four lectures were delivered on Celtic mythology and literature, while the Flemish, Dutch, Spanish and French Schools of Painting were the subjects of the lectures for the rest of the Session.

The steady improvement made each year in the conception of the subjects for figure composition is mainly due to the systematic study of the Old Masters and to a deeper study of literary sources.

Craft Classes.—The Craft classes (Etching and Engraving, Stained Glass, Pottery, Writing and Illumination, Embroidery and Tapestry, Weaving, Marble and Stone Carving, Furniture Decoration and Gesso work, and Metal and Enamelling) continued to exercise a beneficial influence on the work of the students of the School of Design.

Training in Teaching.—33 Students assisted in the teaching of the Day and Evening Classes in the College, and gained valuable experience in posing the models and arranging drapery.

The classes in Methods of Teaching were attended by 135 students; the Senior Students-in-Training lecturing as in former years on the Elementary subjects of the Board's Examinations.

Evening School.—Classes were held in Drawing extremities of the Figure from the Antique, in Anatomy, and in Drawing from the life. It is by constant practice in these classes that the draughtsmanship of the students of all Schools is kept at so high a level.

THE GEOLOGICAL SURVEY OF GREAT BRITAIN AND MUSEUM OF PRACTICAL GEOLOGY.

THE GEOLOGICAL SURVEY OF GREAT BRITAIN AND MUSEUM OF PRACTICAL GEOLOGY.

Report for the Year 1907.

Changes in the Staff.

Mr. E. H. Cunningham Craig, who returned from special service in Trinidad in June, resigned his appointment as Geologist on the 22nd October.

Mr. Alexander Pringle, who in 1877 was appointed Assistant Curator of the Museum of Practical Geology, retired owing to the age limit on 31st May. Mr. W. F. P. McLintock, B.Sc., was appointed to the vacant post on the 24th October.

Dr. Gabriel W. Lee was appointed Geologist on the 15th May in the place of Mr. G. W. Grabham.

The substitution of a Second Division Clerk for the Clerk to the Geological Survey was approved, and Mr. Elliott was appointed for permanent duty.

Mr. J. Pringle was appointed Assistant in the Fossil Department in the room of Mr. J. Rhodes, who became Assistant in the Petrographical Department. Both these titles were shortly afterwards changed to that of Assistant for Survey Collections. Mr. D. Tait was also appointed Assistant for Survey Collections. The post of Curator of the Geological Survey Collections, Edinburgh Museum, was abolished and the duties attaching to the post have been divided between officers of the Survey and of the Museum.

Mr. T. A. Johnstone was appointed Fossil Collector on the Staff in England and Wales in the room of Mr. J. Pringle, and Mr. H. S. McVey, temporary draughtsman, was appointed Fossil Collector on the Scottish Staff, vice Mr. D. Tait.

England and Wales.—Field Work.—The work was arranged in three districts as follows:—

1. Midland District, under Mr. G. W. Lamplugh.
2. Southern District, under Mr. C. Reid.
3. South Wales District, under Dr. A. Strahan.

1. *Midland District.*—Field work was carried on in Sheet 112 (Chesterfield) and was commenced in 113 (Ollerton) by Dr. W. Gibson, Mr. C. B. Wedd, Mr. R. L. Sherlock, Mr. B. Smith and Mr. G. W. Lamplugh under the

superintendence of the last-mentioned officer. Some preliminary field work has been done in Sheet 100 (Sheffield). In addition Dr. Gibson examined materials and collected information from important borings and sinkings for coal at Wentbridge, Brodsworth, Bentley, Thorne, Maltby, Owthorpe and Chorley, in areas outside the limits of those at present in course of survey. The area surveyed amounts to 176 square miles and entailed the tracing of 762 miles of geological boundaries.

The Memoir on Sheet 126 (Newark and Nottingham) has been completed and sent to the printer. The preparation of the Map and Memoir of the Melton Mowbray district (Sheet 142) has been proceeded with, and the materials necessary for the Nottingham (Special) Map and Memoir and some for the Memoir on Sheet 112 (Chesterfield) have been collected.

2. *Southern District.*—Field work was completed in Sheet 335 (Trevose Head), and was continued in Sheets 336 (Camelford) which was nearly completed, in 337 (Tavistock and Launceston), and in 359 (Lizard). A small area was surveyed in Sheet 322 (Boscastle).

The Memoirs on Sheets 335 (Trevose Head) and 349 (Ivybridge) have been proceeded with, and those on 336 (Camelford), 347 (Bodmin), and 359 (Lizard) have been put in hand.

An area of 154¾ square miles, with 747½ miles of geological boundary lines, was surveyed, under the superintendence of Mr. Reid, with the assistance of Dr. J. S. Flett, Mr. G. Barrow, Mr. J. B. Hill, Mr. D. A. MacAlister, and Mr. H. Dewey. Mr. W. A. E. Ussher was occupied in the preparation of Memoirs on the geology of areas surveyed by him near Plymouth and Liskeard, St. Austell, Ivybridge, and the Quantock Hills. Mr. MacAlister, Mining Geologist, examined the old mine plans of Devonshire that are preserved in the Home Office, and marked the lodes on the six-inch maps.

3. *South Wales District.*—Field work was continued in Sheets 228 (Haverfordwest) and 245 (Pembroke) and it was commenced in 227 (Milford Haven) and 244 (Linney Head), under the superintendence of Dr. A. Strahan.

An area of 72 square miles, with 502 miles of geological boundary-lines, was surveyed in Pembrokeshire by Dr. Strahan, Mr. T. C. Cantrill, Mr. E. E. L. Dixon, Mr. H. H. Thomas and Mr. O. T. Jones. The area included the central part of the Pembrokeshire Coal-Field.

The Memoir on Sheet 229 (Carmarthen) was proceeded with. A general memoir on the Coals of South Wales was written by Dr. Strahan and Dr. Pollard, and the Memoirs on Sheets 228 (Haverfordwest) and 245 (Pembroke) were commenced.

The total area surveyed in England and Wales amounts to 402¾ square miles, with 2,011½ miles of geological boundary-lines; being an average of five miles of boundary to the square mile.

In addition to the ordinary field work Mr. George Barrow examined the cuttings on the new branch of the Great Western Railway between Ashendon, Bicester, and Aynho, near Banbury. He likewise examined the cuttings on the new railway in course of construction between Enfield and Little Berkhampstead, and made some further notes on the strata penetrated in the Rotherhithe Road tunnel.

A proposed site for the new Solar Physics Observatory was examined and reported on by Mr. H. B. Woodward. He also paid a visit to Tisbury, by request of the Local Government Board, for the purpose of examining the site of certain springs proposed to be utilized as a source of water-supply, and reporting on the geological structure and the possibility of contamination.

Indoor Work.—During the year Mr. Barrow has given much attention to the arrangement and cataloguing of the field-maps and MS. copies of one-inch and six-inch maps in the office. Assistance has also been rendered by Mr. C. Fox-Strangways in preparing thirteen one inch maps of East Yorkshire for colour-printing, and in arranging and cataloguing the MS. six-inch maps of that county.

At the Geological Survey Office information was given to the Superintending Civil Engineer of the Admiralty with regard to the geological structure of the eastern side of Portsmouth Harbour. Information was also given to officers of the Local Government Board and to the Secretary of the Royal Commission on Canals and Waterways.

As usual, numerous other inquiries made personally, and by letter, in reference to water-supply, sites of houses, building-stones, peat, mineral deposits, etc., have been attended to.

The Memoir on the new London Maps has been proceeded with, that on Sheet 295 (Taunton and Bridgwater) was completed, and that on Sheet 339 (Teignmouth and Newton Abbot) has been put in hand.

Of Water-supply Memoirs that on Kent has been completed, and those on Northamptonshire and Bedfordshire, and on Hampshire, have been proceeded with. A Memoir on the Water-supply of Oxfordshire has been commenced, and also a supplement to the Memoir dealing with Sussex. Provision for dealing with a similar Memoir on Surrey, during 1908 has been made.

Progress has been made with the New Series Index Map on the scale of one-inch to four miles. Of the Drift Edition, Sheets 16, 20 and 24, and of the Solid Edition, Sheets 1 and 2, 3, 4, 5 and 6, 7, and 23 have been published. Sheets 8, 14, 22, and 20 and 24, have been prepared for engraving.

In the Draughtsmen's Office, under the superintendence of Mr. H. W. Gilbert Williams the following work has been done :—

Fifty-three drawings, chiefly for memoirs, have been executed.

Of six-inch maps, 72 dry proofs have been made, while 40 original coloured copies have been prepared and a corresponding number of first engraved proofs have been checked. In addition, 78 colourist's patterns have been prepared, and 96 standard copies have been coloured for permanent reference. Eighty-six MS. coloured copies have been made, mostly for use in the library.

With regard to MS. copies of six-inch maps required by the public, 58 have been made. These are as follows :—Bedfordshire 28 S.E., Buckinghamshire 10 N.W., N.E., S.W., S.E., 14 N.E., S.E., 19 N.W., S.W., 20 S.W., Carmarthenshire 47 S.W., 53 N.E., S.E., 54 N.W., S.W., 57 N.E., 58 N.W., Cornwall 41 N.W., N.E., S.W., S.E., 50 N.W., N.E., 56 N.E., 59 S.W., S.E., 66 N.W., N.E., 67 S.W., 68 N.E., ; Cumberland 25 N.W., N.E., S.W., S.E., ; Dorset 32 N.E., 47 S.W., ; Flintshire 9 S.W., S.E., ; Glamorgan 23 N.E., (two) ; Hampshire 63 N.E., ; Monmouthshire 17 N.E., S.E., 18 N.W., S.W., 22 N.E., S.E., 23 N.W., N.E., S.W., ; Oxfordshire 47 S.W., S.E., 50 N.W., N.E., S.W., S.E. ; Wiltshire 77 S.E. ; Yorkshire 117.

Of one-inch maps, one dry proof and four patterns for colour-printing have been prepared, and five colour-printed proofs have been checked.

Of quarter-inch maps, five dry proofs and eight patterns for colour-printing have been prepared, and ten colour-printed proofs checked.

As regards vertical sections of Colliery Shafts, 29 have been drawn for publication.

The following is a list of the Maps and Memoirs issued and in course of publication during 1907 :—

I. Maps.

(*a*) Four Miles to One-Inch Maps

New Series ; Solid Edition ; Colour-printed.

Sheet 1 and 2 (Alnwick, Berwick, etc.)	Published.
Sheet 3 (Carlisle, Keswick, and part of Isle of Man).	
Sheet 4 (Newcastle-upon-Tyne, Stockton, etc.).	
Sheet 5 and 6 (Lancaster, Preston, Wigan, Southport, Isle of Man).	
Sheet 7 (Leeds, Manchester, York, etc.).	
Sheet 23 (Bournemouth, Isle of Wight, Selsey Bill, etc.).	

New Series ; Drift Edition ; Colour-printed.

Sheet 16 (Cambridge, Colchester, Ipswich, etc.).	Published.
Sheet 20 and 24 (London, Dover, and Brighton).	

Sheet 8 (Solid).	Colour-printing
Sheet 22 (Solid).	
Sheet 14 (Solid).	Engraving.
Sheet 18 (Solid).	
Sheet 19 (Solid).	
Sheet 20 and 24 (Solid).	
Sheet 9 and 10 (Solid).	Dry-proofing.
Sheet 15 (Solid).	

(*b*) One-Inch Maps.

New Series ; Colour-printed

Sheet 230, Ammanford, (Solid and Drift).	Published.
Sheet 247, Swansea, (Solid and Drift).	
Sheet 254, Henley on Thames, (Drift).	
Sheet 348, Plymouth, (Drift).	
Sheet 351 and 358, Penzance, (Drift).	
Sheet 353, Mevagissey, (Drift).	
Sheet 125, Special Oxford Sheet, 295.	Colour-printing.
Sheets 126, 229, 347.	Engraving.
Sheets 34, 35, 43, 44, 53, 54. 55, 63, 64, 65, 71. 72, 73.	Hand-coloured maps now being prepared for colour-printing.
Sheet 142.	Dry-proofing.

(*c*) Six-Inch Maps of Mining Districts.

Brecknockshire, 48 N.W., 49 N.E., 50 N.W., N.E.	Published.
Glamorganshire, 10 N.W., S.W., S.E., 11 S.W., S.E., 17 N.W., N.E., S.W., S.E., 18 N.W., N.E., S.W., S.E., 27 N.W., N.E., S.W., 35 N.W., S.W., S.E., 41 N.W., N.E.,	
Monmouthshire, 12 S.W.	
Staffordshire, 13 N.W., 19 N.W. (Drift only), N.E. (Solid only), S.W.	
Glamorganshire, 36 N.W., N.E., S.W., S.E., 37 N.W., N.E., S.W.	Engraving.
Monmouthshire, 18 N.W., S.E., 22 N.W., N.E., S.W., S.E., 23 N.W., N.E., S.W., 28 N.W.	

Brecknockshire, 46 S.W., 47 N.W., N.E.
Carmarthenshire, 47 S.E., 54 S.W., S.E., 57 N.W., N.E., S.E., 58 N.W., N.E., S.E.
Cornwall, 63 N.W., N.E., S.W., S.E., 67 S.W., 69 N.W., N.E., S.W., S.E., 73 N.W., 75 N.W., N.E.
Glamorganshire, 7 N.E., S.W., S.E., 12 N.W., N.E., S.W., S.E., 14 N.W., N.E., S.W., S.E., 19 N.W., N.E., S.W., S.E., 22 N.E., S.E., 23 N.W., N.E., S.W., S.E., 28 N.W., N.E., S.W., S.E., 42 N.W.
Monmouthshire, 10 S.E., 11 S.W., S.E., 17 N.W., N.E., S.W., S.E., 18 S.W., 27 S.E., 28 S.W.

} Sent for Engraving.

(*d*) Six-Inch Reference Maps.

Seventy MS. coloured copies of Six-Inch quarter sheets have been made from the field copies, and deposited in the Office for Public Reference.

These are as follows :—

Cornwall, (24 S.W. and 24a S.E.,) 24 S.E., 25 S.W., 26 S.E., 27 N.W., S.W., 32 S.E., 33 N.W., N.E., S.W., S.E., 34 N.W., S.W., 40 N.E., S.E., 41 N.W., N.E., S.W., S.E., 42 N.W.

Essex, 65 N.W., 73 S.E.

Gloucestershire, 2 S.E.

Leicestershire, 11 S.E., 12 N.E., S.W., S.E.

London, 4 N.W.

Merioneth, 19 N.E., S.W., S.E., 26 N.W., S.W., S.E., (31 S.E. and 32 S.W.,) 32 N.E., 36 N.W., (portions with mining information).

Middlesex, 2 S.E., 7 S.W., 9 N.E., S.E.

Northumberland, 3 N.E., S.W., S.E., 4 S.W., 7 N.W., N.E., S.W., S.E.

Nottinghamshire, 33 N.E., 42 S.W., S.E., 46 N.W., N.E., S.W., S.E., 47 N.W., N.E., S.W., S.E., 50 N.W., N.E., S.W., 51 N.W.

Surrey, 1 S.E., 11 N.E., 12 N.E.

Warwickshire, 6 N.W., S.W., 44 N.E.

II. Memoirs.

Published Memoirs.

Summary of Progress of the Geological Survey of Great Britain and the Museum of Practical Geology for 1906, pp. 181. Price 1s.

The Geology of the South Wales Coal-Field. Part VII. The Country around Ammanford (Sheet 230), by Aubrey Strahan, M.A., Sc.D., F.R.S., F.G.S., T. C. Cantrill, B.Sc., F.G.S., E. E. L. Dixon, B.Sc., F.G.S., and H. H. Thomas, M.A., B.Sc., F.G.S., pp. 246. Price 2s. 6d. Part VIII. The Country around Swansea (Sheet 247), by Aubrey Strahan, M.A., Sc.D., F.R.S. F.G.S., (with parts by R. H. Tiddeman, M.A., F.G.S., W. Gibson, B.Sc., F.G.S. and E. E. L. Dixon, B.Sc., F.G.S., and a Supplementary Geological Bibliography of South Wales and Monmouthshire, by O. T. Jones, M.A., B.Sc.) ; pp. 170. Price 2s. 6d. Part IX. West Gower and the Country around Fembrey (Sheet 246), by Aubrey Strahan, M.A., Sc.D., F.R.S., F.G.S. (In part from Notes by B. S. N. Wilkinson, T. C. Cantrill, B.Sc., F.G.S., and E. E. L. Dixon, B.Sc., F.G.S.), pp. 50. Price 8d.

The Geology of the Country around Hungerford and Newbury, (Sheet 267), by H. J. Osborne White, F.G.S., pp. 150. Price 2s. 6d

The Geology of the Land's End District, (Sheets 351 and 358), by Clement Reid, F.R.S., and J. S. Flett, M.A., D.Sc., with contributions by B. S. N. Wilkinson, E. E. L. Dixon, B.Sc., and W. Pollard, M.A., D.Sc. Mining Appendix by D. A. MacAlister, A.R.S.M., pp. 158. Price 3s. 6d.

The Geology of the Leicestershire and South Derbyshire Coalfield, by C. Fox-Strangways, F.G.S., with Palæontological Notes and List of Fossils by A. R. Horwood, pp. 373. Price 6s.

The Geology of the Country around Plymouth and Liskeard (Sheet 348); by W. A. E. Ussher, F.G.S., with notes on the petrology of the Igneous Rocks by J. S. Flett, M.A., D.Sc., pp. 156. Price 3s.

The Geology of the Country around Mevagissey (Sheet 353), by C. Reid, F.R.S., with notes by J. J. H. Teall, D.Sc., F.R.S. pp. 73. Price 2s.

The following memoirs are in different stages of progress :—

The Geology of the Southern End of the Derbyshire and Nottinghamshire Coalfield (Sheet 125), by W. Gibson, T. I. Pocock, C. B. Wedd, and R. L. Sherlock, with notes by C. Fox-Strangways. (*Ready, awaiting map.*)

The Geology of the Country around Andover (Sheet 283), by A. J. Jukes-Browne. (*In slip proof.*)

The Geology of the Country around Oxford (Special Sheet), by T. I. Pocock, with notes by H. B. Woodward and G. W. Lamplugh. (*Passed for Press.*)

The Geology of the Country around Henley-on-Thames and Wallingford (Sheet 254) by A. J. Jukes-Browne and H. J. Osborne White. (*MSS. with printers.*)

The Geology of the Quantock Hills and of Taunton and Bridgwater (Sheet 295) by W. A. E. Ussher. (*In page proof.*)

The Geology of the Country between Newark and Nottingham (Sheet 126) by G. W. Lamplugh. (*MSS. with printers.*)

The Water Supply of Kent, by W. Whitaker, with contributions by Dr. H. F. Parsons and Dr. H. R. Mill. (*Mostly in slip proof.*)

The Coals of South Wales, by Dr. Aubrey Strahan and Dr. William Pollard. (*MSS. with printers.*)

Museum of Practical Geology.—The total number of visitors to the Museum during the year has been 58,104. This number represents 39,251 upon week-day mornings, 11,532 on Monday and Saturday evenings and 7,321 on Sundays.

A list of donations to the Museum is given on pp. 18–22.

The ordinary course of work has been considerably interfered with by the opening up of the Museum extension and by the retirement of Mr. Pringle from the post of Assistant Curator.

The lighting and general appearance of the ground floor of the Museum have been greatly improved by the recent alteration.

During the year, the Curator visited the districts of Purbeck and Portland and obtained specimens, photographs and information relating to Building Stones, etc. In this connection, thanks are specially due to the Bath Stone Firms Ltd. for their courteous assistance.

Continuing the scheme for illustrating new memoirs and maps by a collection of rocks, fossils and photographs of the district, the following exhibits have been arranged, with the co-operation of the Field-staff :—

Newquay, Sheet 346.

Falmouth, Sheet 352.

Ammanford, Sheet 230.

West Gower, Sheet 246.

Swansea, Sheet 247.

In the Photographic Section the first batch of fully-catalogued negatives has been taken over from Mr. Hall, and prints of the same have been mounted and bound in volumes for reference.

Numerous classes and parties have visited the Museum, and several demonstrations have been given by the Curator.

Besides the structural alterations mentioned above, several minor changes have been effected. The old projecting rail on the Piccadilly front of the building has been removed, thereby increasing the width of the footpath. The old rail has been replaced by an ornamental rail set back in the recesses. This improvement necessitated the construction of a new service door in the Jermyn Street front in place of the trap door removed from Piccadilly.

Much of the material in the basement has been rearranged in order to economise space; and special provision has been made by means of steel racks, for the storage of certain registered specimens.

The Library.—Additions have been made to the Library by purchase, donation and exchange.

Scotland.—Field Work.

1. *West Highland District.*—Glencoe and Ben Nevis, Mull and Colonsay in the counties of Argyll and Inverness. Sheet 35 was completed, field work was continued in Sheets 53 and 44. A narrow strip along the south margin of Sheet 43 in the Ross of Mull was surveyed in continuation of the work in Sheet 35. Under the superintendence of Mr. Clough as District Geologist, Mr. Cunningham Craig, Mr. Wright, Mr. Muff and Mr. Bailey mapped 60¾ square miles, with 628 miles of boundary—averaging 10 lineal miles to the square mile.

During the summer, field work was continued in the deer forest region between Glencoe and Ben Nevis (Sheet 53), but the progress of the mapping in that mountainous region was seriously impeded by exceptionally wet weather. Hence at the close of the Highland season a larger area than was anticipated remained to be surveyed in this Sheet. It amounts to 29¼ square miles. In the autumn, mapping was continued in Colonsay, Lismore and Mull (Sheets 35, 43, 44).

The Memoir of Sheet 28 (Knapdale and part of Jura) was proceeded with. The Memoir of Sheet 60 (The Small Isles) is now being printed off. The paged proof sheets of the Memoir of Sheet 45 (Oban and Dalmally) are now being corrected.

2. *North Highland District.*—In the Counties of Inverness and Caithness. Sheet 74 was completed. Field work was continued in Sheets 109 and 110. Sheet 116 was finished during 1906. Mr. Hinxman as District Geologist, with the assistance of Mr. Grant Wilson, Dr. Crampton, Mr. Anderson, Mr. Carruthers, and in the autumn of Dr. Horne, mapped 219¾ square miles with 1,020½ lineal miles of boundary.

During the summer the mapping was continued in the deer forest areas in Sheets 74 and 109, and in the autumn, in the grouse ground, in Sheets 74 and 110.

The Memoirs of Sheets 71 (Sleat, Glenelg and Balmacara), 64 (Forest of Atholl and Ben MacDhui), and 83 (Beauly and Strathpeffer) are completed. The Memoir of Sheet 93 (Garve and Strathcarron in Easter Ross) was proceeded with.

During the last quarter of the year, the members of the staff directed their attention to the revision of the Carboniferous areas extending from Airdrie, north by Cumbernauld and east by Falkirk to the Carron coalfield.

3. *Airdrie and Shotts District.*—Mr. Clough as District Geologist, with the co-operation of Mr. Wright and Mr. Bailey, revised 29¾ square miles with 104 lineal miles of boundary. Mr. Clough and Mr. Wright re-examined an important area of Coal-measures extending from Calder north by

Rawyards to Midtown. Mr. Bailey completed the revision of the small areas in the Glasgow district map left unfinished at the close of 1906, consisting of contemporaneous volcanic rocks and Upper Old Red Sandstone. The whole of the area within the Glasgow district map has now been revised.

4. *Carron and Slamannan District.*—The field work was under the supervision of Mr. Hinxman, who was assisted by Mr. Grant Wilson, Dr. Crampton, Mr. Anderson and Mr. Carruthers, and together they revised an area of 61 square miles with 203¾ lineal miles of boundary. Mr. Hinxman traced the development of the fireclays in the Millstone Grit from the Glenboig area north-east to Cumbernauld, while Mr. Carruthers, Mr. Anderson, Mr. Wilson and Dr. Crampton re-examined portions of the Coal-measures near Greengairs, Slamannan, Falkirk and Carron respectively.

Various applications for geological information were made during last year. The most important of these referred to the fixing of sites for bores, the identification of seams in the cores of bores, to veins of ore, and to water-supply.

The Memoir of East Lothian (Sheet 33, with parts of 34 and 41) is completed, and the Memoir of the Glasgow district map has been proceeded with.

The total area surveyed in the Highlands during 1907 amounted to 280½ square miles with 1,648½ miles of boundary lines.

The total area revised in the Carboniferous districts of the Midland valley of Scotland amounts to 90⅜ square miles, with 307¾ miles of boundary lines.

The Memoir on "The Geological Structure of the North-west Highlands of Scotland" and the Memoir on "The Geology of Islay" were issued during 1907.

All the proof sheets of the Memoir on "The Geology of the Small Isles." (Sheet 60) were corrected before the end of the year and the Memoir is now being printed off.

The paged proof sheets of the Memoir of Sheet 45 (Oban and Dalmally) are now being revised.

Mr. Craig completed the description of the area surveyed by him in the Ross of Mull before his retirement from the service.

Mr. Hill has written a large part of his description of the area mapped by him in Sheet 28 (Knapdale, Argyllshire) for the Memoir of that map.

Mr. Bailey has devoted considerable time to the petrology of the Igneous Rocks within the area of the Glasgow district map, for the Memoir of that sheet, and has also written portions of the descriptions of the areas surveyed by him in Sheets 53 and 35.

Fourteen quarter sheets (New Series, Edinburgh and Haddington), have been published. Twenty-four quarter sheets (New Series, Edinburgh, Haddington and Linlithgow) are engraving. Two quarter sheets (New Series, Linlithgow) have been dry-proofed and twenty quarter sheets (New Series, Linlithgow, Lanark, Stirling, Renfrew and Dumbarton) have been partly dry proofed.

Two sheets of the index map on the scale of four miles to one inch have been published and one is engraving.

Of the one-inch maps, one has been passed for printing, six are engraving and four have been partly dry-proofed.

Of the drift editions (one-inch scale) one sheet is engraving and one has been dry-proofed.

In continuation of the scheme of preparing typed copies of all journals of bores in the Scottish Office, the records of 78 bores were typed during 1907, comprising 179 foolscap pages of MS., these referred to Carboniferous areas in the counties of Stirling, Lanark, and Argyll.

The rock specimens gathered during last season numbered 423. Of these, 42 were collected by Mr. Macconochie from the counties of Ayr, Roxburgh, Renfrew, Haddington, Edinburgh, and Fife, and 281 by Mr. Tait from Ayr, Lanark, Renfrew, Stirling, Linlithgow, Midlothian, and Fife. One hundred specimens were collected from Fife by Mr. McVey.

During the year, Mr. Tait completed the arrangement, according to one-inch sheets, of the collection of rock specimens in the Survey Office.

Mr. Lunn took 150 photographs illustrating the geology of the island of Colonsay, and of the Ardfern and Glencoe districts of Argyllshire. A catalogue of the Scottish negatives, numbering a little over 2,000 is in course of preparation.

The draughtsmen have prepared 47 dry-proofs of six-inch maps, five dry-proofs of one-inch maps, and one dry proof of the quarter inch map. They have also prepared 23 standard pattern copies of six-inch maps, checked a large number of engraved proofs and colour-models, and made MS. coloured copies for the public of the following six-inch sheets:—Argyll, 204 N.E., S.E. (parts of); Dumbarton 19 N.W., S.W., (parts of); Forfar 54 N.W.; Haddington, 7 S.W., 11 N.E., S.E., (parts of), 12 N.W., S.W., (parts of); Lanark, 7 S.W., (3 copies); Linlithgow, 1 N.W., N.E., S.W., S.E., (parts of).

The following is a list of Maps and Memoirs issued and in course of publication during 1907:—

I. Maps.

(*a*) Four Miles to One-Inch Maps.

Sheet 16, 17 (Colour-printed).	Published.
Sheet 12.	Engraving.
Sheet 15.	Dry-proofing.
Map for the North West Highlands Memoir.	Published.

(*b*) One-Inch Maps.

Sheet 45	Passed for printing.	
Sheet 32 (2nd edition) 36, 71	Solid and Drift lines.	Engraving.
Sheet 60, 86, 92	Solid Geology lines.	
Sheet 33, 64, 83, 93	Dry-proofing.	

Drift lines now being engraved on the published one inch map (Solid Geology). Sheet 37.

Drift lines dry-proofed on the engraved one-inch map (Solid Geology). Sheet 65.

(*c*) Six-Inch Maps of Mining Districts (New Series).

Edinburgh, 3 N.E., S.E., 4 N.E., 7 N.E., S.E., 8 N.W., S.E., 12 S.E., 13 N.W., N.E., S.W., S.E.	Published.
Haddington, 4 S.W., S.E.	
Edinburgh, 5 N.E., S.E., 9 N.W., S.W., 11 N.W., S.W., 15 N.W., 18 N.E., 19 N.W., N.E.	Engraving.
Haddington, 9 N.W., N.E., S.W., S.E., 14 N.E., 14 S.E. with Edinburgh 9 S.E.	
Linlithgow, 2 N.W. and S.W., S.E., 3 S.W., 6 N.W., S.W., S.E., 10 N.W., S.W.	
Linlithgow 1 N.E., S.E. Dry-proofed.	
Linlithgow, 6 N.E., 7 N.W. and S.W., 9 N.E., S.E., 12 N.E.	Partly dry-proofed.
Lanark, 1 S.E., 6 N.E., S.W., S.E., 10 N.W., N.E., 11 N.W., S.W.	
Stirling, 27 S.E., 28 S.W.	
Renfrew, 12 N.E., S.E., 13 S.W.	
Dumbarton, 25 N.E., 33 N.E.	

(*d*) Six-Inch Reference Maps.

The following copies of six inch sheets have been completed and deposited in the Office for reference :—

Argyll, 200.

Caithness, 2, 3, 6, 7, 8, 12, 13, 23, 24, 25.

Elgin, 32, 33.

Inverness, 15, 16, 34, 131.

Ross, 26, 36, 62, 75, 84, 111, 112.

II. Memoirs.

Published Memoirs.

District Memoir.—The Geological Structure of the North West Highlands of Scotland, by B. N. Peach, LL.D., F.R.S., J. Horne, LL.D., F.R.S., the late W. Gunn, C. T. Clough, M.A., F.G.S., and L. W. Hinxman, B.A. With Petrological Chapters and Notes by J. J. H. Teall, M.A., D.Sc., F.R.S., Edited by Sir Archibald Geikie, K.C.B., D.C.L., Sec.R.S.

District Memoir.—The Geology of Islay, including Oronsay and portions of Colonsay and Jura (Explanation of Sheets 19 and 27 with the western part of Sheet 20). By S. B. Wilkinson with Notes by J. J. H. Teall, D.Sc., F.R.S., and B. N. Peach, LL.D., F.R.S.

The following Memoirs are in various stages of progress.

1. The Geology of the Small Isles (Sheet 60). (*Being printed off.*)
2. The Geology of the District between Oban and Dalmally (Sheet 45). (*In paged proof sheets.*)

Museum Work.—The fossils stored in the under cases in the Geological Survey Gallery of the Royal Scottish Museum were removed to the Survey Office. Of these, the specimens collected by the late Mr. Bennie have been arranged according to Dr. Kitchin's scheme and a card catalogue of the localities of all the fossils that have been collected by the Geological Survey in Scotland, is now in preparation.

The best specimens of the fossil fishes collected in 1906 by the Geological Survey from the Old Red Sandstone of Caithness have been incorporated in the exhibited collection.

Petrographical Department.—Except during his absence in the field surveying the crystalline schists of the Lizard, Dr. Flett has been employed in the office preparing and revising petrographical chapters for memoirs and drawing up descriptions of rock slides for the field geologists. In October, he spent ten days in Edinburgh examining the Scottish rock collections in the office and in the Royal Scottish Museum. Mr. H. H. Thomas, as in previous years, has attended to the petrography of the South Wales district. Mr. E. B. Bailey takes charge of the petrography of the Glasgow area, and Mr. H. B. Muff, Mr. W. B. Wright and Mr. H. Dewey have spent some time in the London office investigating the microscopic petrology of the districts which they had mapped in the field. In Dr. Flett's absence, Mr. H. H. Thomas answered urgent enquiries of a petrographical nature which were received from field officers or members of the general public.

The petrographical chapters for the Memoirs on Sheet 32 (Midlothian) and 45 (Dalmally) have been revised in accordance with additional information received. Dr. Flett has corrected portions of the Plymouth, Land's End and Dalmally Memoirs for the Press. The Director has corrected the proofs of the North West Highland Memoir and the Islay and Glenelg Memoirs. Mr. Barrow has made contributions to the petrography of Sheet 64 (Falar) and 347 (Bodmin Moor). Mr. H. H. Thomas has revised for the press the

petrographical data in the Ammanford Memoir (230). During 1907, Dr. Flett, supplied reports on 667 rocks to field officers and in reply to enquiries from the public, Mr. H. H. Thomas has prepared reports on New Red Sandstones for Mr. Ussher, and on axinite and other minerals for Mr. Barrow.

The number of rock slices cut annually continues to increase. The total for 1907 is 1,522, including 826 English, 455 Scotch, 205 Foreign, 10 palæontological and 26 miscellaneous. The sliced rocks in the collections now number 21,363, including 6,566 English, 13,521 Scotch, 24 Irish and 1,252 Foreign. During 1907, rock slides to the number of 1,549 and 371 rock specimens were dispatched to officers in Edinburgh or in the field who wished to examine them. 144 specimens of English rocks and 218 specimens of rocks from abroad have been presented to the Survey and Museum; they include 97 Anglesey rocks (given by Mr. Edward Greenly, F.G.S.) and 18 volcanic rocks from Somersetshire (presented by Professor Reynolds, F.G.S.). Among the important donations of foreign rocks we may mention 149 specimens from British East Africa, given by Mr. H. B. Muff and 30 cordierite rocks, limurites etc., presented by Professor A. Lacroix, of Paris. The full list of donations appears in the appendix.

Mr. T. C. Hall has taken 66 photomicrographs and 140 views illustrative of British geology, principally in Cornwall and Devonshire; 96 prints were prepared and exhibited in the museum with collections of British rocks and fossils from districts on which memoirs had recently appeared. The negatives now in our registered collections are 1,019 (483 photomicrographs and 536 landscapes). Twelve plates of photomicrographs have been used during the year to illustrate Geological Survey memoirs which are in course of publication. The descriptive catalogue of landscape negatives has been completed and an album prepared with prints and all particulars; this is deposited in the library for the use of the public.

Mr. Hall has collected 166 rock specimens for Museum purposes with smaller specimens for slicing. As new cases had been provided for sliced rocks the English collection was transferred to them by Mr. John Rhodes and the Scottish collection rearranged. Mr. Rhodes has cut the greater portion of the additional rock slides added to the collections.

Mr. H. H. Thomas has nearly completed his revision of the nomenclature of the Welsh rocks exhibited in the Museum. Several cases showing the geology of districts recently described in Survey memoirs have been exhibited in the Museum and Mr. Rhodes and Mr. Hall have prepared the petrographical materials for these exhibits. The provision of new accommodation for storing rock-specimens in the crypts of the Museum, which was made during the latter part of the year, has afforded much-needed space for the expansion of the collections and a beginning has been made in the work of transferring a portion of the rock-collections to the new cases.

Chemical Work.—The greater part of the past year has been employed by the chemist in completing the chemical part of the work in connection with the South Wales Coal-field, and in the preparation of the manuscript for publication.

Mr. Radley has been almost exclusively occupied in carrying out analyses of rocks for petrological purposes.

Twenty three complete rock and mineral analyses, six assays, seven complete and two proximate coal analyses, together with a large number of estimations to check analytical methods, etc., in connection with coal analysis, have been completed during the year.

Such assistance as has been possible has been given to the Field and Museum Officers.

Palæontological Department.—*London.*—Upwards of 9,000 specimens of fossils have been collected during the year in England and Wales, and nearly 4,000 specimens, added to the Survey reference collection in the London Office, have been entered in the register-books. The great majority of these materials were obtained in connection with current work in the field. The principal donations to the palæontological collections in London were a series of Mollusca from the Kimeridge and Speeton beds of Speeton, Yorkshire, presented by Mr. C. G. Danford, and a set of Ordovician fossils from Haverfordwest, presented by Mr. V. M. Turnbull. A complete list of the presentations to the Museum of Practical Geology is printed on pages 18–22. The chief addition by purchase was a series of mammalian bones from the Pliocene beds of Norfolk and Suffolk, including a femur of *Elephas meridionalis* figured by Leith Adams (Palaeontographical Society, 1881, p. 223, pl. XXVI, fig. 3); together with a series of Mammalia, partly of Pliocene age, dredged from the bed of the North Sea. The specimens collected in the course of the Survey work came from formations ranging from the Ordovician to the Cretaceous, but the great majority were from the Lower Palæozoic rocks of South Wales.

In addition to carrying on the routine work of the Office, Dr. Kitchin and Mr. Allen spent much time in revising the palæontological matter in numerous Memoirs which were being passed for publication. After conferring with several members of the staff, they drew up a set of editorial instructions for the guidance of those who may have to prepare the palæontological portions of Memoirs whereby a greater degree of consistency and uniformity of method may, in the future, be attained. In the month of May, Dr. Kitchin visited Edinburgh, and in conference with Dr. Horne made a number of recommendations for the future conduct of palæontological work in the Scottish Office. Mr. Allen completed the preparation of a manuscript catalogue of the Tertiary Vertebrata in the Museum, and all these specimens have now been mounted and arranged.

The Lamellibranchiata of the Carboniferous Limestone have also been arranged and catalogued, and the majority of the figured specimens have been noted. Mr. Allen arranged a case in the Museum for the exhibition of a large series of Mollusca from the Speeton Beds, and a selection of specimens to illustrate the zonal palæontology of the Carboniferous Limestone according to Dr. A. Vaughan's scheme.

Dr. Ivor Thomas has been chiefly occupied in naming extensive suites of specimens for the purposes of the current Survey work. These materials were of a very varied character, coming from many sheets of the map, and from formations ranging from Ordovician to Pleistocene. Dr. Thomas has also named other sets of fossils and has attended to numerous enquiries.

During the year, 1527 specimens have been submitted to specialists who are not members of the staff, who have reported upon them. Mr. E. A. N. Arber, Dr. Wheelton Hind, Mr. P. Lake, Mrs. Shakespear, Dr. R. H. Traquair and Mr. H. Woods have shared in this work. Mr. R. Kidston has examined a series of plants collected many years ago from the Coal Measures of Anglesey, now in the possession of Mr. T. Prichard, which were made available through the instrumentality of Mr. E. Greenly; he has also continued the preparation of his Memoir on the flora of the Coal Measures. Mr. Arber has completed his revision of the collection of plants from the Coal Measures, in the Museum.

Good progress has been made with the work of registering specimens in the Museum. In addition to carrying out this task, Mr. S. W. Morgan has done much revision of labelling in the Museum, particularly amongst the Graptolites, Carboniferous Lamellibranchs, plants from the Coal Measures, and Cretaceous Lamellibranchs. He cleared wall-case 15 on the second gallery in preparation for structural repairs, and remounted and labelled the specimens before replacing them. Clerical duties of a miscellaneous character have also occupied much of his time.

Mr. John Pringle was engaged during eight months of the year in collecting fossils in the counties of Oxfordshire, Devonshire, Cornwall, Pembrokeshire and Cardiganshire, and he obtained specimens to the number of 4,352. After May 13th, he was assisted in this work by Mr. T. A. Johnstone, who, later in the year, collected 1,152 specimens in South Wales. Mr. Pringle's work in the Office consisted chiefly in arranging series of fossils in permanent storage and in keeping the reference-catalogue up to date.

In the month of September, a large number of the delegates to the Centenary Celebration of the Geological Society availed themselves, while in London, of the opportunity of examining those portions of the Museum collection in which they were specially interested. They were afforded all possible facilities in these studies.

Many enquiries have been answered during the year, and 205 specimens have been lent, chiefly to specialists, for the purposes of study.

Edinburgh.—Palæontological work was carried on in Scotland during the last seven months of the year under Dr. G. W. Lee. The efforts of the palæontological staff were mainly directed towards the arrangement of the collection of fossils in the Survey Office, in accordance with the recommendations of Dr. Kitchin. The fossils collected by the late Mr. Bennie, amounting to a little over 40,000 specimens, are now, with the exception of those exhibited in the Royal Scottish Museum, arranged according to their registration numbers in new cabinets that have been provided for that purpose in the Survey Office.

The total number of fossils collected during the year and entered in the Survey List Books amounts to 1,795. Mr. Macconochie collected 380 specimens, Mr. Tait 1,194, and Mr. McVey 221, all from the Carboniferous areas.

The fossil fishes, amounting to 213 specimens, were determined by Dr. Traquair, F.R.S. Mr. Kidston, F.R.S., named 489 specimens of Carboniferous plants, and Dr. Wheelton Hind 289 specimens of Lamellibranchs. Those groups that were not sent to specialists outside the Survey, were examined, in the earlier part of the year by Dr. Crampton, and in the latter part by Dr. Lee. In addition, Mr. Carruthers named the Corals obtained in connection with the revision of Carboniferous areas and revised the nomenclature of this group for the Sheet Memoirs.

Dr. Lee visited various localities in the Carboniferous areas where deep bores had been put down, in order to determine the fossiliferous horizons.

TABLE 1.—ENGLAND AND WALES.—ABSTRACT OF WORK DONE DURING THE YEAR 1907.

Districts.	Surveyors.	Square Miles Surveyed.	Miles of Boundary Traced.	Maps Published.			MS. Copies of Six-Inch Maps deposited.	Memoirs Published.	Microscopic Slides Prepared.	Rock Specimens Collected.	Photographs Taken.	Fossils Collected.
				One-Inch to Four Miles.	One-Inch.	Six-Inch.						
1. MIDLAND DISTRICT.												
Derbyshire. } Nottinghamshire.	5	176	762									
2. SOUTHERN DISTRICT.												
Cornwall.	6	154¾	747½	8	8	30	70	9	826	166	302	5,504
3. SOUTH WALES DISTRICT.												
Carmarthenshire. } Pembrokeshire.	5	72	502									
TOTALS.	—	402¾	2,011½	8	8	30	70	9	826	166	302	5,504

Table II.—Scotland.—Abstract of Work done during the Year 1907.

Districts.	Surveyors.	Square Miles.		Miles of Boundary Traced.	Maps Published.		MS. Copies of Six-Inch Maps Deposited.	Memoirs Published.	Microscopic Slides Prepared.	Rock Specimens Collected.	Photographs Taken.	Fossils Collected.
		Surveyed.	Revised.		One-Inch to Four Miles.	Six-Inch.						
1. West Highland District. Argyllshire. Inverness-shire.	5	60¾	—	628	2	14	24	2	455	423	150	1,795
2. North Highland District. Caithness-shire. Inverness-shire.	6	219¼	—	1,020½								
3. Airdrie and Shotts District.	3	—	29⅝	104								
4. Carron and Slamannan District.	5	—	61	203¾								
Totals	—	280½	90⅝	1,956¼	2	14	24	2	455	423	150	1,795

Statement showing the number of Geological Maps and Sections issued by the Ordnance Survey to Agents during the year ended 31st December, 1907.

Particulars.	England and Wales.	Scotland	Total.
FOUR MILE MAP:—			
Colour-printed	689	46	735
ONE INCH SHEETS:—			
Old Series: Whole Sheets - - solid	337	485	822
Old Series: Whole Sheets - - drift	116		116
Quarter Sheets - - solid	1,178		1,178
Quarter Sheets - - drift	265		265
New Series: Hand-coloured - - solid	36		36
New Series: Hand-coloured - - drift	77		77
Colour-printed - - solid	486		486
Colour-printed - - drift	1,109		1,109
SIX INCH SHEETS:—			
County maps sheets	261	441	702
County maps quarter sheets	555	149	704
TWENTY-FIVE MILE MAP:—			
Coloured - - - - -	1,339		1,339
Uncoloured - - - -	29		29
Index - - - - -	8		8
Horizontal Sections - - - - - -	127	12	139
Vertical Sections - - - - - -	138	38	176
Index to Colour and Signs - - - - -			
One inch Scale Maps Great Britain and Ireland - - - - - - - -	5		5
Total - -	6,755	1,171	7,926

LIST OF DONATIONS TO THE MUSEUM OF PRACTICAL GEOLOGY DURING THE YEAR 1907.

ABELSPIES, J. F. G., Esq., F.G.S.—Copper-bearing Clay, from El Cobre Copper Mine, Santiago, Cuba.

ANDERSON, D. A., Esq.—Two rolled fragments of Andalusite Crystal, from Chivalingo, Chili.

CASTLEMAN, C., Esq.—Massive Ytterspath or Xenotime, from Torskebacken, Wermland, Sweden.

CHUDLEIGH. J., Esq.—Picrite from Highweek, Newton Abbot, Devon.

COLLINS, F. G., Esq., F.G.S.- Crystallised Orthoclase and Quartz, from Hennock, Bovey Tracey, Devon.

COMMISSIONER, The Servian Royal, for the Balkan States Exhibition. Two specimens of Magnesite, one from Avala and the other from Razana, Servia.

COMMISSIONER, Trades, for the Cape of Good Hope—Specimen of Ore from a new mine, Stellenbosch, S. Africa.

Crawshaw, Capt.,—Pumaceous Tuff from Tierra del Fuego.

Crossley and Sons, Ltd., Messrs.—Samples of Bricks from Commondale, N. R. Yorks.

Danford, C. G., Esq.—Sixty-eight specimens of Mollusca, from the Kimeridge and Speeton beds of Speeton.

Davies, A. M., Esq. D.Sc. F.G.S.—Serpulae and Mollusca, from the Kimeridge Clay, near Brill.

Dean and Chapter of St. Paul's, The.—A Box of samples of Valley gravel, &c., from the Trial boring recently made at St. Paul's Cathedral.

Dibley, G. E., Esq., F.G.S.—Chalk, from the *Belemnitella plena* zone, Blue Bell Hill, Durham.

Dixon, E. E. L., Esq., B.Sc., F.G.S.—White Chalcedony after Chalybite or Dolomite, from Wheal Unity Cornwall.

Dodsdown Brick Works, Ltd.—Samples of Bricks from Burbage, Marlborough, Wilts.

Enderby & Stoney Stanton Granite Co., Ltd.—Samples of Granite, Narborough, Leicester.

Excelsior Patent Stone Co.—Samples of Patent Stone, Granite Chips, Portland Cement and Stone Paving Slabs.

Flett, J. S., Esq., M.A. D.Sc.—Eleven Graptolites, from the Llandovery Beds of Parys Mountain Mine, Anglesey.

Glossop, Messrs. W. & J.—A sample of "Lambton Granite."

Greenly, E., Esq., F.G.S.—A series of ninety-seven Anglesey Rocks.

Hall, A. L., Esq., B.A., F.G.S.—Four Micro-Slides from the Transvaal Geological Survey.

Hand, W. C., Esq.—Two specimens of Auriferous Quartz and two specimens of Auriferous Rock, from the Bogomdarovonie Mine, Atchinsk District, Siberia ; Specimen of Copper Ore and specimen of Silver-bearing Rock, from the South Caucasus.

Harker, A., Esq., M.A., F.R.S.—Essexite Melaphyre, from Holmertrand, Norway.

Harwood, J. H., Esq.—Wolframite, from Buttern Hill, Davidstow Moor, Cornwall.

Hawkesworth, E., Esq.—Eight specimens of *Griffithides barkei*, H. Woodw., from the Lower Carboniferous of Angram, Nidderdale.

Holland, T. H., Esq., F.R.S., F.G.S.—Nepheline Syenite containing Sodalite, from Kishengark, Rajputana, India.

Hopkins, E., Esq.—Group of Emerald Crystals with some matrix from the Urals ; a small pear-shaped bead of reconstructed ruby.

Howel, R., Esq.—A specimen of *Prestwichia*, from the Coal Measures near Neath.

Hughes, J., Esq.—A specimen of *Calymene c.f. tristani* Brongn., from Bryngwallen, Anglesey.

Imperial Stone Co., Ltd.—Specimen of "Imperial" stone, with Crushed Granite and Cement for same.

Julius Hulsen & Co., Ltd., Messrs.—Samples of Bricks from Newcastle-on-Tyne.

Kendall, Rev., H. G. O., M.A.—Rolled Flint with certain fractured surfaces, coated with Chalcedony, from Knowle Farm Pit, Savernake, Wilts.

Kit Hill Granite Co., The.—A sample of Kit Hill Granite from Callington, Cornwall.

Lacroix, Prof. A.—A series of 30 mineral specimens, from Arkansas, Brazil Pyrenees, etc.

Lawrence, H. M., Esq.—Specimen showing a peculiar structure (? organic) in slate.

Lecco, Prof. Marco T., President, Committee of the Balkan States Exhibition.—A selection of Samples of Building Stones and Marble; Cement Stones, Millstones and Magnesite.

Lobley, Prof. J. L., F.G.S.—Quartz Conglomerate, now being exploited for Gold, from the Brownstone Beds of the Upper Old Red Sandstone, Drybook, Forest of Dean, Gloucestershire.

Lomas, J., Esq., F.G.S.—Piece of Slickenside, from a fault in the Keuper Prenton Hill, Storeton, Cheshire; Piece of the Bunter Sandstone, from Storeton; Specimen from the top of the Bunter at Scarth Hill, Ormskirk, showing the sifting action of the wind.

London Brick Co.—Samples of Fletton Bricks and Clay.

Mansfield & Co., Messrs. H. R.—Samples of Bricks and Roofing Tile from the Hermitage Brick Works, Whitwick, nr. Leicester.

Marsden, C., Esq.—A specimen of *Productus giganteus* (Martin), from the Carboniferous Limestone of Bakewell, Derbyshire.

Marshall, E. L., Esq.—Cassiterite in Limestone, from Changkat Pari Mine, Kinta Valley, Perak, Malaya.

Muff, H. B., Esq., B.A., F.G.S.—One hundred and forty-nine British East African Rocks.

Norris, Ltd., C. H.—Samples of Shingle and Sand from Erith, Kent.

Nostell Brick and Tile Works.—Samples of Roofing Tile, Brick and Clay, near Wakefield, Yorks.

Pascall & Sons, Messrs Thos.—Samples of Bricks and Roofing Tiles, South Norwood, S.E.

Pearson, H., Esq.—Pisolite from Brazil.

Pearson, H. B., Esq.—Stream Tin, from 40 miles inland from Cape York, Alaska; Chrysocolla investing Cuprite, from the Emperor Nevada Mine, Yerington, Nevada; Massive Tetrahedrite with disseminated Copper Pyrites; Tetrahedrite crystallised with Copper Pyrites; Arseopyrite and Copper Pyrites with an undetermined mineral, from Archipelago Mine, Cumpas, Montezuma, Sonora, Nevada.

Pellew Harvey & Fell, Messrs.—Large mass of Bornite, from Yuspenssky Mine, Spassky Copper Mines, Siberia.

Penyghent Stone Co., The.—A sample of Economic Stone.

Perrett Bros., Messrs.—A sample of Clay, Area Brick, and Roofing Tile, Sutton, Surrey.

Pierce, R., Esq.—Granite, said to contain 40 pounds of Oxide of Tin per ton, from Dolcoath.

Poole, H. S., Esq., M.A., F.R.S. (Canada), F.G.S.—Baddeckite, a Copper-Coloured Clay, from the Glacial Drift, Baddeck, Cape Breton, Nova Scotia.

Pringle, A., Esq., M.A., B.Sc.—Section of Quartz Pebble, from the interior of a geode.

Pringle, J., Esq.—A specimen of *Lepidodendron veltheimianus*, Sternb, from the Coal Measures near Wigan.

Reid, C., Esq., F.R.S.—A specimen of *Pinna decussata*, Goldf., 13 of Pollicipes, five Ossioles of Goniaster and a Foraminifer from the Chalk of Trimingham. A series of Seeds, from the Forest Bed, near Cromer.

Reynolds, Prof. S.H., M.A., F.G.S.—Sixteen specimens of Corals, Brachiopods, Molluscs and Trilobites, from the Silurian of Tadhill; and a series of 18 Rock Chips, from Down Head, Moon's Hill, Somersetshire.

Roberts, C. L., Esq.—Sample of Diatomite as worked at Lake Cuithir, Island of Skye, N.B.

Roberts, R. L., Esq.—Two specimens of *Stigmaria* from the Clee Hills.

Rodriguez, Sr. J.—Sample of Garnets, from Almeria, Spain.

Rowe, Dr. A. W., F.G.S.—A specimen of *Ostrea lateralis*, Nilss, from the Zone of *Actinocamax quadratus* at Rottingdean.

Sandbegue, A. de, Esq., Assoc. M.Inst., C.E.—A specimen of brown Iron Ore, Tealby Beds, Wellon, Lancashire.

Schmassmau, W., Esq.—Quartz shewing conchoidal fractures stained with Iron Oxide, from Oberstein, Germany.

Scott, Col. B., R.E.—Portion of Ironstone Concretion mounted on four silver knobs, for use as a salt cellar, from Island of Kach, East India.

Silverdale Tileries Co.—Sample of Roofing Tiles, from Silverdale, Staffs.

Smith, C. Esq.—A "Waterstone" or Shell Agate, with enclosed water from Paraquay.

Smith, Messrs. S. & W.—A specimen of massive White Fluor Spar from the Low Mine, near Matlock.

Soltau, W. E., Esq.—Cleavage Plate of Mica about 11 in. diameter from Grenville, Prov. of Quebec.

Steuart, D. R., Esq.—A series of samples, illustrating the raw material and products of the Broxburn Oil Company Limited.

Stopes, Miss M. E., D.Sc.—A single Coal Ball as it comes out of the Coal from the Upper Foot Mine, Lancashire; Mass of irregular Coal Balls, taken from Coal Seam, from the Upper Foot Mine; Small Coal Balls scraped and washed from Upper Foot Mine; Rounded Ball from "floor" from the floor of the Upper Foot Mine; Small piece of nodule, from the roof above the Upper Foot Mine; A single Coal Ball from the Union of the Foot Mine and Ganister at Bacup; Two small Coal. Balls cut through, from an horizon in the Millstone Grit; Half a Coal Ball from the New horizon at Stalybridge, below Wood Hill Rock; Coal showing lenticular masses of Stone from Great Harwood Colliery, Accrington.

Tarbutt, P. C., Esq.—Hopeite from Rhodesia; Tarbuttite from Rhodesia.

Thomas, Capt. R. A.—Strings of Cassiterite in altered Granite, from 375 fms level, Dolcoath Mine, Cornwall.

Thompson Sons Ltd., Jabez.—Terrawode Brick and Slab from Terra Cotta Works, Northwich, Cheshire.

Towers & Williamson, Messrs.—Four samples of Adamantine; Buff Clinker and two unburnt samples, from little Bytham, Grantham.

Treacher, Ll. Esq., F.G.S.—A sponge, from the Greensand of Faringdon.

Trower, Richard, Esq.—Samples of Bricks from Siding Brickworks, Redhill, Surrey.

Tucker, Messrs. G. & Son.—Specimens of Bricks, varied sizes, etc., and Roofing Tiles from Loughborough.

Turnbull, V. M., Esq., M.A.—Ninety-one specimens of Ordovician fossils from Haverfordwest.

Walker, the late J. F., Esq., M.A.—Six specimens of *Rhynchonella leightonensis* Walker, from the lower Greensand of Shenley Hill, Leighton Buzzard.

Walton, H. E., Esq.—Three Mollusca and a series of Otoliths from the Barton Beds of Barton.

Whitaker, W., Esq., B.A., F.R.S.—Selenite containing Sand, from the Oldhaven Beds, cliff between Reculvers and Herne Bay; A specimen of Silicified Wood bored by Mollusca, from the Chalk N.N.E. of Dover.

Willett, —, Esq.—Four Flint Implements, from Savernake.

Woodhead, J. H., Esq., F.G.S.—Seven specimens of bones of *Cetiosaurus*, from the Great Oolite of Wolverton.

Woolridge, C. A., Esq.—Alluvial Tantalite, from Woodgina, Pilbara Gold-Field, Western Australia.

Worthington, J. H., Esq.—Three Twin Crystals of Calcite.

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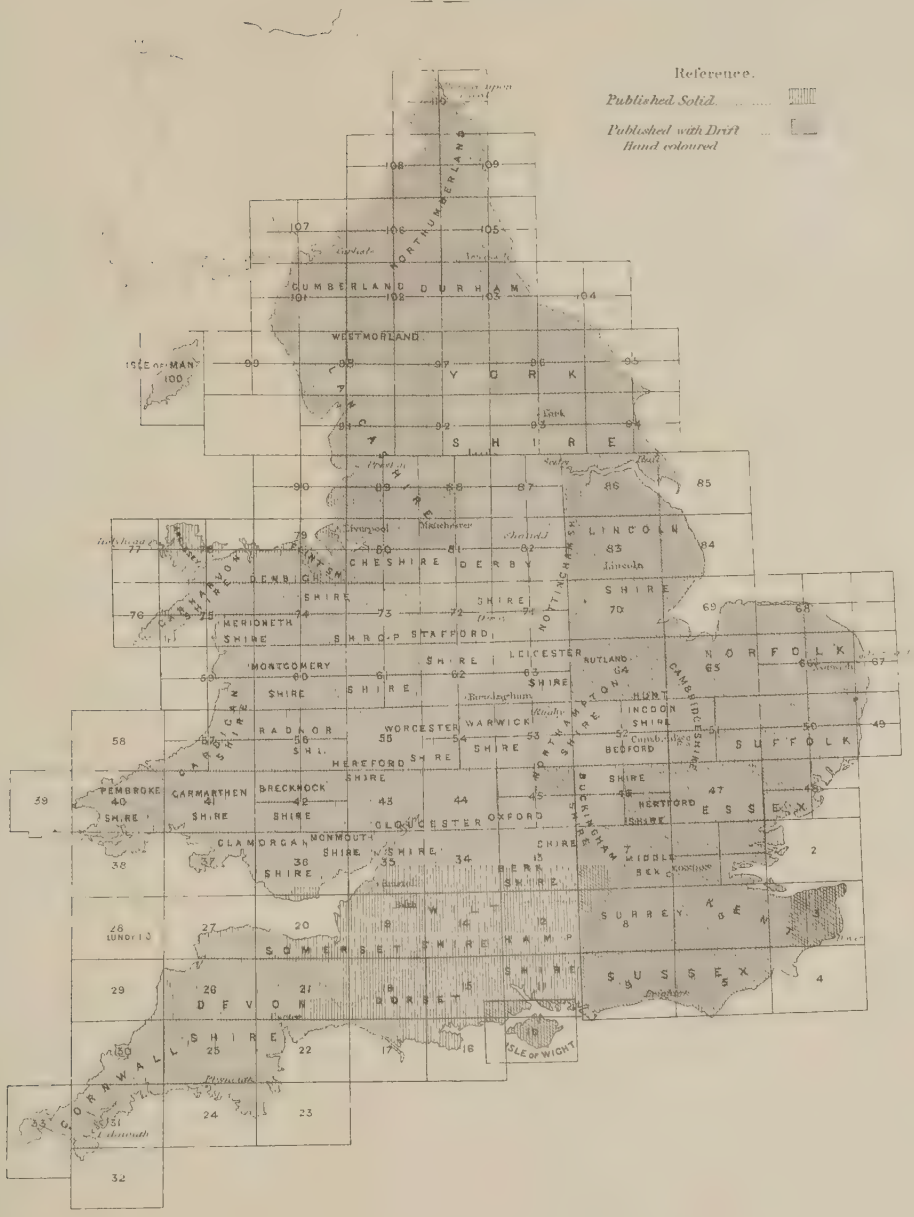

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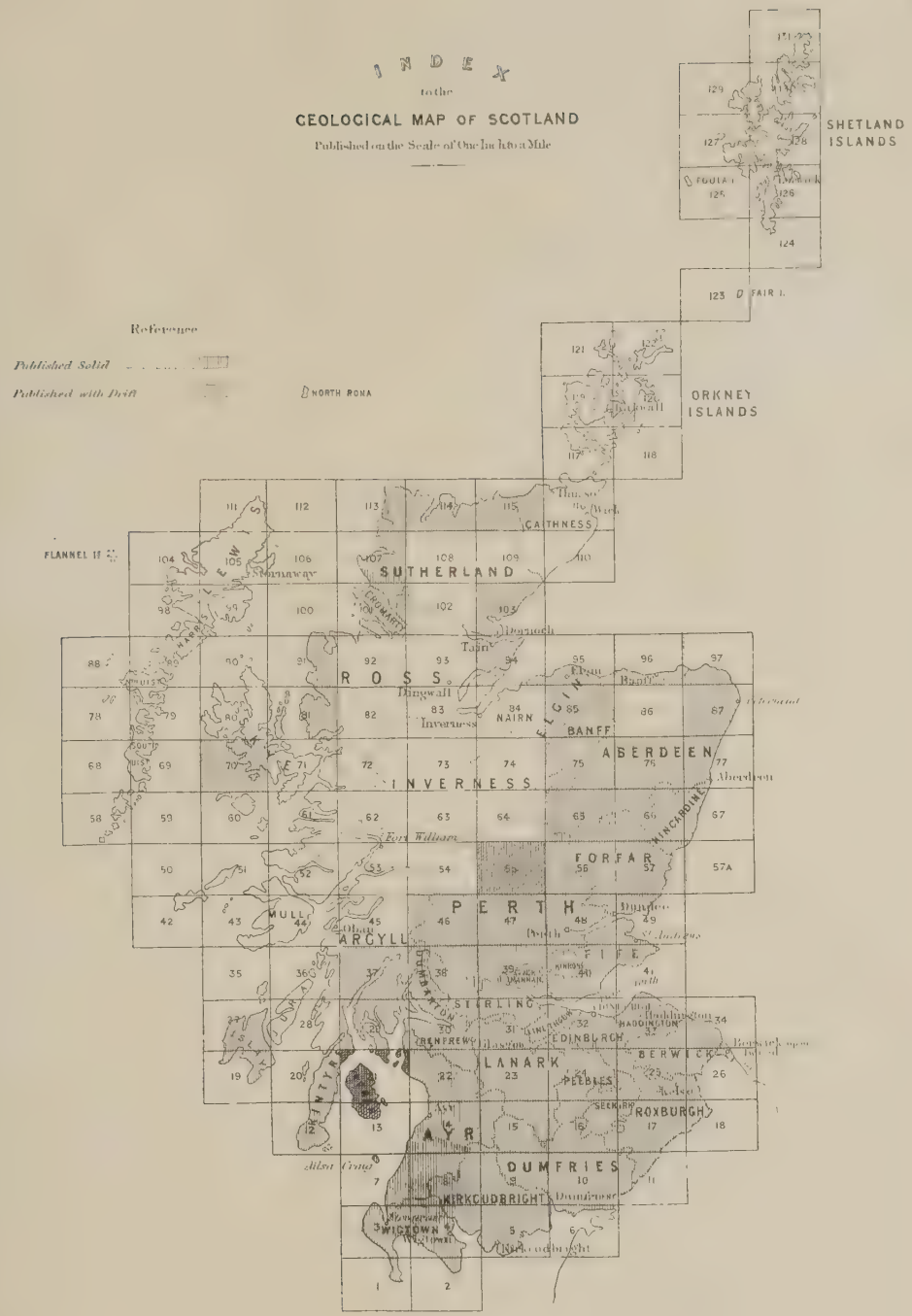
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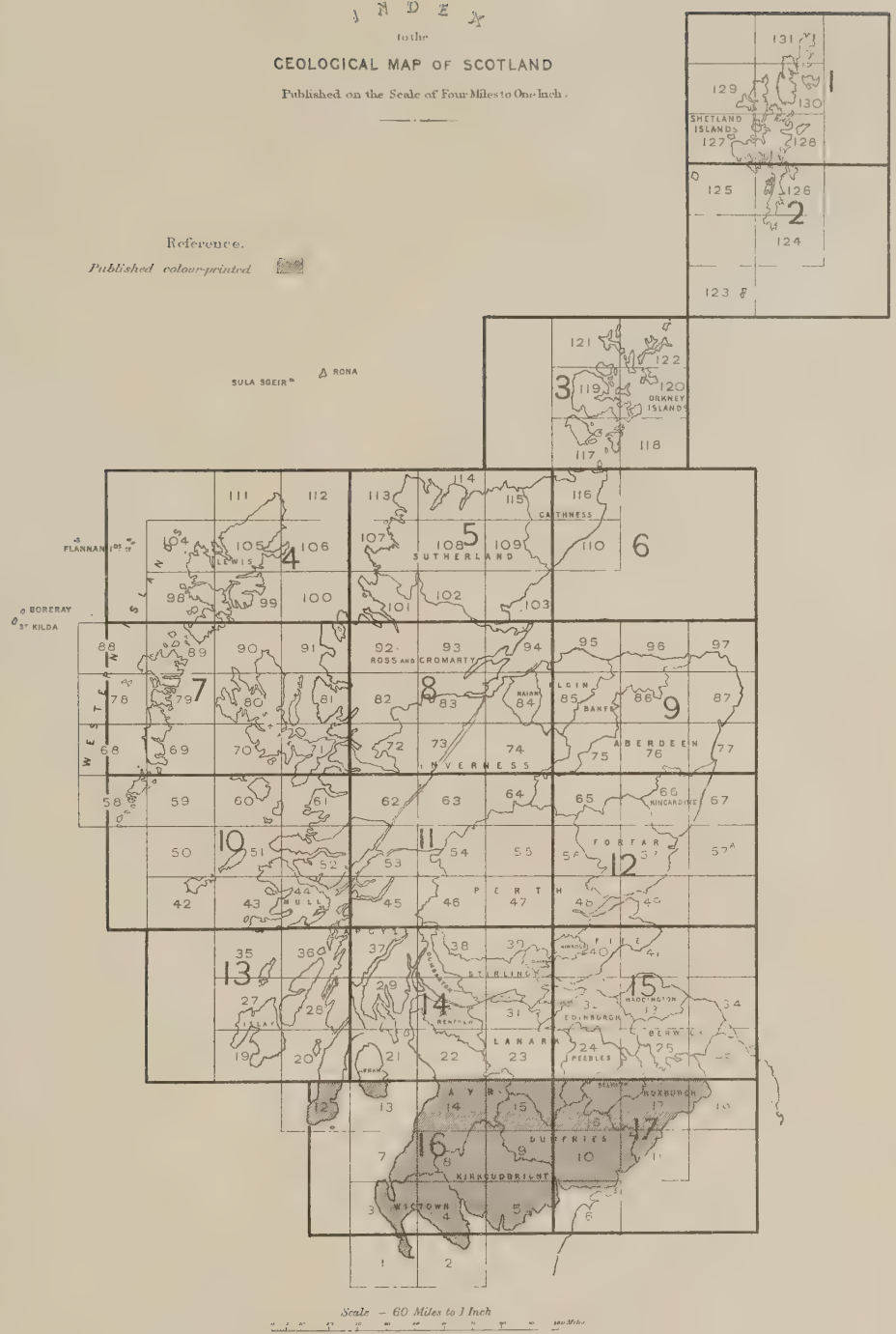


Scale — 60 Miles to 1 Inch

SOLAR PHYSICS COMMITTEE.

SOLAR PHYSICS COMMITTEE.

SOLAR PHYSICS OBSERVATORY.

I.—Laboratory Work.

(a.) *Rowland Grating.*

No further spectra have been photographed with this instrument during the past year.

(b.) *3-inch Cooke Spectroscope.*

The spectra of the following substances have been photographed with this instrument:—

No.	Substance.	Description.	Region.	Source of Temperature and Conditions.
204	Sulphur, powdered	—	3600–6000	Vacuum tube
205	„ „	—	„ „	Air spark Platinum poles
206	Sodalite from Canada	From Dr. Bell	„ „	Arc on silver pole
207	Sun	—	„ „	—
208	Sulphur dioxide	—	„ „	—
209	Sulphur dioxide } Helium }	—	„ „	Vacuum tubes
210	Lithium Chloride	—	„ „	Arc on carbon poles
211	Lithium Chloride	—	„ „	Arc on silver poles
212	Lithium Chloride	—	„ „	Spark on silver poles
213	Lithium, Calcium & Vanadium Chlorides	—	„ „	Arc on silver poles. Short exposures
214	„ „ „	—	„ „	Arc on silver poles. Long exposures
215	Neon	From Sir Wm. Ramsay	„ „	Vacuum tube

(c.) *Three-prism Laboratory Spectroscope.*

This instrument was employed during the early part of the year in an investigation of the spectrum of sulphur arising out

of the discovery of the stellar occurrence of this element. Photographs of the spark spectrum of sulphur vapour and of sulphur dioxide under varied electrical and physical conditions were obtained, which confirmed the differential variation of lines of this element.

II.—Sun-Spot Spectra.

(a.) *South Kensington.*

Observations of the solar disc have been made whenever the weather permitted and the most widened lines have been observed in the spectra of 211 spots. Excluding Sundays, there were 313 observing days during the year.

The following is a digest of the observatory note-book during this period:—

Month.	No. of Spot-Spectra observed.	Days on which					
		Observations of Spot-Spectra were made.	"No Spots" was recorded.	Spots recorded, but too small for Spectrum Observations.	Spots observed, but Spectra not recorded owing to bad Weather.	Bad Weather entirely prevented Observations.	Assistants were on duty for Observation.
1907.							
Jan. -	17	7	0	0	10	10	27
Feb. -	19	9	0	0	7	8	24
March -	12	12	0	3	8	3	26
April -	17	7	0	1	12	6	26
May -	12	6	0	9	7	5	27
June -	8	8	1	5	5	6	25
July -	38	17	0	1	8	1	27
Aug. -	21	13	0	0	11	3	27
Sept. -	33	12	0	0	11	2	25
Oct. -	27	12	0	0	9	6	27
Nov. -	3	2	1	1	11	11	26
Dec. -	4	2	0	0	15	9	26
Totals— 1907 -	211	107	2	20	114	70	313
1906 -	225	122	8	20	103	60	313
1905 -	268	125	6	13	97	71	312
1904 -	181	114	3	18	106	73	314

The widened lines now recorded are still, in the main, due to Vanadium and Titanium, and next in order of importance to lines ascribed to these elements there are several, frequently recorded, well widened lines in the F-b region which have hitherto been described as due to unknown elements. Recent

work by Mr. Fowler has shown that these lines are probably due to a fluted structure seen in the spectrum of magnesium associated with hydrogen.

Owing to the growth of the trees in the grounds of the Natural History Museum, to the south of the observatory, the time during which sun-spot spectra may be observed in winter is considerably curtailed.

(b.) *Poona.*

Further observations of the widened lines recorded at the Maharajah Takhtasinghi Observatory, Poona, have been received; the dates extend from December, 1906, to November, 1907. Although during this interval the observers attended on 18 Sundays, non-attendance on Government holidays, and the dismounting of the instrument, reduced the number of days on which observations were made to 300. Out of this number 63 days were unfavourable for any observations, and on 1 day "No Spots" was recorded. Spectroscopic observations were made on 177 days, and 549 spots were examined.

The following table gives a digest of the Poona observations for this period:—

Month.	Number of Spot-Spectra observed.	Days on which						Number of week-days available.
		Observations of Spot-Spectra were made.	"No Spots" was recorded	Spots recorded, but too small for Spectrum Observations.	Spots observed, but Spectra not recorded owing to bad Weather.	Bad Weather entirely prevented Observations.	Observations were made.	
1906.								
Dec. - -	57	18	0	4	5	1	28	26
1907.								
Jan. - -	118	27	0	0	1	1	29	27
Feb. - -	109	23	0	0	1	0	24	24
March -	58	21	0	3	0	0	24	26
April - -	39	14	0	1	5	7	27	26
May - -	29	13	0	12	0	0	25	27
June - -	13	12	0	0	4	11	27	25
July - -	4	3	0	0	7	16	26	27
Aug. - -	2	2	0	0	2	22	26	27
Sept. - -	64	18	0	0	5	3	26	25
Oct. - -	27	14	0	1	1	0	16	27
Nov. - -	29	12	1	2	5	2	22	26
Dec.-Nov. Totals -	549	177	1	23	6	63	300	313

Very good agreement continues to obtain between the Poona and South Kensington records of spot spectra. The differences which still remain are chiefly in order of arrangement and are not more than might be expected to result from differences in observers and in the instrumental and atmospheric conditions of observation, operating on the very difficult task of selecting six lines from among a number of lines nearly equally changed in conspicuousness.

Brief monthly and more extensive quarterly reports on the observations of widened lines in sun-spots have been, as usual, forwarded to the Minister of Public Instruction, Poona.

(c) *Kodaikanal.*

Since the date of the last report, observations of widened lines in sun-spot spectra made at the Solar Physics Observatory, Kodaikanal, during the months October, November and December, 1906, and January and February, 1907, have been forwarded to South Kensington.

(d) *Kensington Sun-Spot Spectrograph.*

During the latter part of the summer a grating spectrograph of large dispersion has been erected. The 12-inch mirror, of 7·2 feet focal length, used in 1905 at Palma for the solar eclipse, is employed to give an image $8\frac{1}{4}$ inches in diameter on the spectrograph slit. The spectrograph is of Littrow form, consisting of a Cooke photo-visual objective of 6 inches aperture, and 20 feet focal length, with a plane Rowland grating having a ruled surface $1{\cdot}9 \times 1{\cdot}3$ inches ($4{\cdot}8 \times 3{\cdot}3$ cms.), 14,438 lines to the inch. Numerous photographs of spot spectra have been obtained, but great difficulty has been met with on account of the vibration due to local traffic. Two or three plates were fortunately secured on which the definition is very good. From a preliminary examination of the spot lines on these plates it is evident that the arrangement will prove efficient for sun-spot investigation when a suitable site for the instrument is secured. The 12-inch concave and the 12-inch plane mirrors were resilvered on 18th August.

III.—Sun Photographs.

A. Photoheliograph.

(a.) *Indian Photographs, 8-inch pictures.*

Since the date of the last report 513 8-inch negatives, taken during the period November 15th, 1906, to November 6th, 1907, inclusive, and 34 12-inch negatives have been received from Dehra Dûn.

No photographs could be taken at Dehra Dûn on the following dates, chiefly on account of bad weather. Gaps in the Indian record are therefore as follows:—

1906. December 12, 28.
1907. January 1, 7, 9, 26

1907. February 2, 3, 4, 5, 6, 9, 10, 14, 16.
March 10, 12, 16, 21, 26.
April 9, 15, 17, 26.
May, complete.
June 8.
July 8, 20, 24, 25, 27, 29, 31.
August 2, 8, 12, 18.
September 5.
October, complete.

500 8-inch and 34 12-inch prints have been forwarded from Dehra Dûn and 53 8-inch prints have been mounted in the usual manner. The dates of the former extend from November 7th, 1906, to November 6th, 1907.

(b) *Mauritius Photographs.*

Since the date of the last report 230 8-inch negatives have been received from Mauritius; these were taken during the period July 1st, 1906, to March 31st, 1907, and from among them the gaps in the Indian record (mentioned in this and previous reports) have been filled up with the exception of the following:—

1906. July, complete.
August 4, 7.
September, complete.
October, complete.
November, complete.
December 28.
1907. January, complete.
February 3, 4, 16.
March 16, 21, 26.
April 9, 15, 17, 26.
May, complete.
June 8.
July 8, 20, 24, 25, 27, 29, 31.
August 2, 8, 12, 18.
September 5.
October, complete.

The last batch of negatives was received from Mauritius on September 11th, 1907; and as these extend only to March 31st, 1907, the above vacant dates in April, June, July, August, and September may be filled up when the next batch arrives.

As in the last two reports no prints have been received during the past year from Mauritius.

When needed to fill up gaps in the series, prints from both Mauritius and Greenwich negatives are made and mounted at South Kensington.

B. Spectroheliograph.

The exchange of photographs between the Kodaikanal Observatory and South Kensington, as described in the last Report, is continued. The formation of a series of daily spectroheliograms is in progress, and negatives for the further period,

November, 1906, to September, 1907, have been received, while 53 positives on glass of the sun's limb obtained at South Kensington during 1907 have been forwarded to Kodaikanal. These were taken during the period March 6th to October 22nd.

To facilitate direct comparison of the spectroheliograph and photoheliograph records of the solar surface, bromide enlargements, 7·5 inches in diameter, are being made from the small solar discs of the original negatives. For the period January 1st, 1906 to February 14th, 38 spectroheliograph enlargements have been mounted alongside the photoheliograph records.

(a.) *South Kensington.*

The observing conditions have been fine enough on 142 days to warrant attempts being made to secure photographs with the spectroheliograph during the period January 3, to December 13,

During the year 351 negatives have been secured showing the distribution of "K" radiation on the sun's disc; of these 239 have been selected for measurement; with the addition of an occulting disc over the primary slit-plate, 62 negatives were obtained showing the prominences, and on most of these the structure on the disc was also separately photographed.

The 6-inch spectroscope mirror was resilvered on February 21, and again on September 18.

The 18-inch siderostat mirror was also resilvered on February 21, June 13, and September 18, while the 12-inch object glass was sent away to Messrs. Cooke & Sons, Ltd., of York, for cleaning on February 18.

Owing to obstruction by buildings and trees the sun is available during the months of December and January for only two hours each day.

(b.) *Kodaikanal.*

Since the arrangements previously referred to came into operation, 465 plates showing the sun's disc in "K" light have been received from Kodaikanal.

These were taken during the period November 1, 1906, to September 30, 1907.

From December 16 to January 31 the siderostat attached to the spectroheliograph was dismounted: in consequence no photographs could be taken.

No photographs were taken at either Kodaikanal or South Kensington on:—

1906 November 1, 3, 4, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18, 22, 24, 25.
December 5, 6, 7, 8, 9, 10, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.

1907 January 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31.

1907 February complete.
March complete.
April 27.
May complete.
June 15, 18, 30.
July 1, 21, 22, 23.
August 8, 11, 12, 26.
September complete.

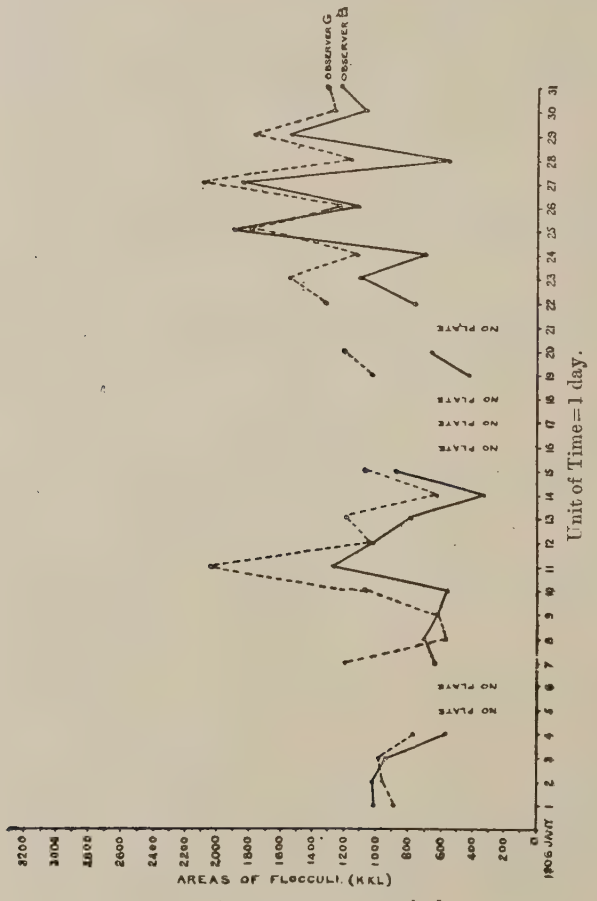
In the table which follows, the number of days in each month on which spectroheliograms were obtained at South Kensington and Kodaikanal respectively are compared. In consequence of work being carried out on Sundays at the latter observatory a column has been added showing the number of spectroheliograms obtained on these extra days.

Month.	South Kensington.	Kodaikanal.	No. of Sundays included in the Kodaikanal record.
1906			
November - - -	4	10	1
December - - -	1	9	2
Totals for 1906 -	151	246	35
1907			
January - - -	6	None.	None.
February - - - -	5	28	4
March - - - -	15	31	5
April - - - -	9	29	4
May - - -	12	31	4
June - - - -	13	24	4
July - - - -	20	23	3
August - - - -	19	22	2
September - - -	17	30	5
Jan.-Sept. Totals -	116	218	31

(c.) *Measures of Flocculi on Spectroheliogram Plates.*

Various methods of measuring the flocculi on spectroheliograms have been tried, as the usual routine procedure for spot areas gave considerable difficulty, chiefly on account of the penumbral boundaries of the flocculous masses rendering their measurement uncertain. The process giving the most accordant results consists in examining the negatives, placed in contact with a glass micrometer plate ruled with squares of $\frac{1}{100}$th inch side, with a low power magnifier. By this means the observer is enabled to see the whole of the area to be measured and so more easily avoid counting the faint half tones which are often seen bordering the flocculi. The measures are at present being made only for *area*, the north and south zones being kept separate, but they are so indexed that the necessary data for position may be obtained at any future time when required.

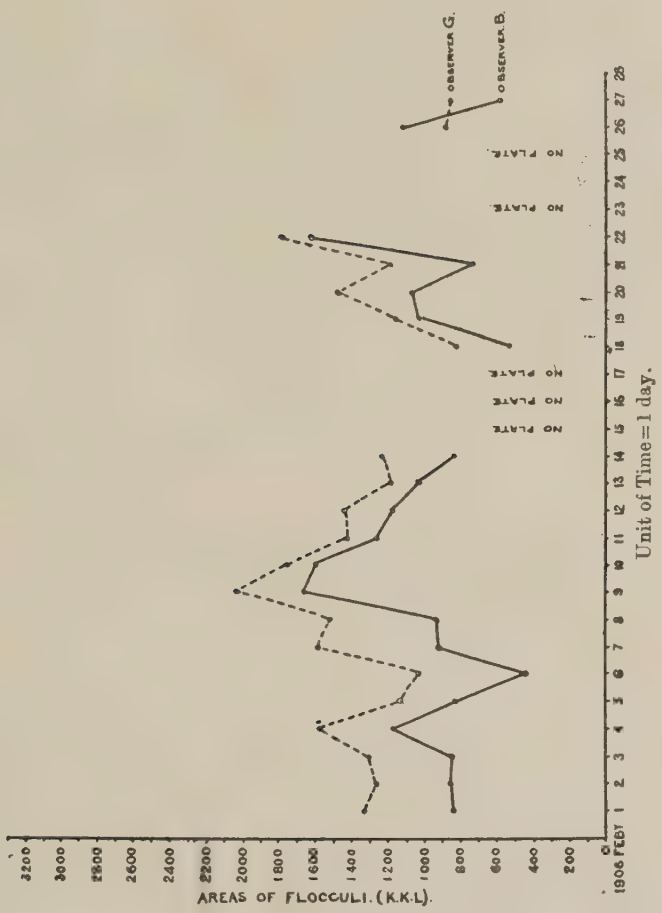
The accompanying Curves, Figs. 1, 2, 3, with very highly magnified ordinates representing areas with respect to time,



Unit of Area = $\frac{1}{100}\frac{1}{100}$ square inch.

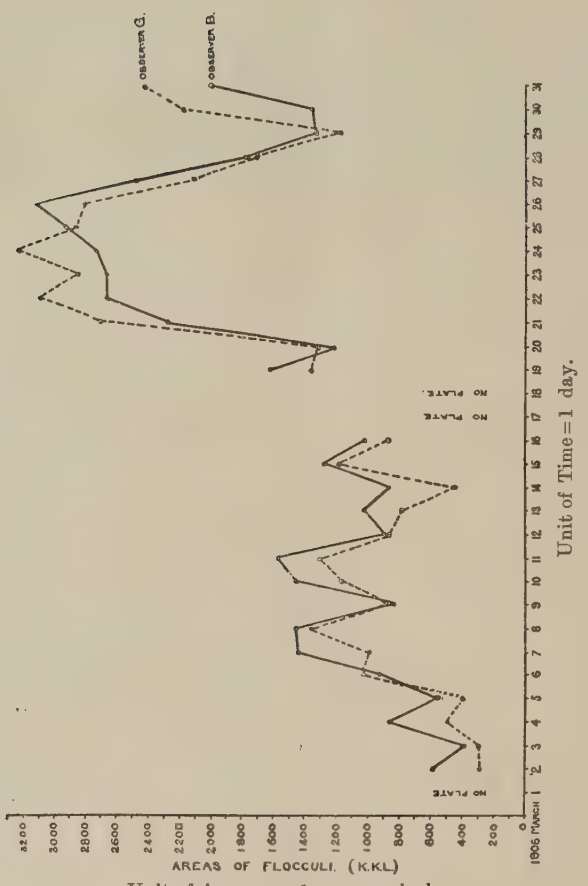
FIG. 1.

show the agreement between two observers, Mr. Butler and Mr. Goodson, designated B. and G. on the curves, when measuring the same series of plates, quite independently, and only *one measure* of each plate having been made. No corrections have as yet been applied for size of disc or foreshortening. To avoid the extreme foreshortening close to the limb the measures have been confined to the area subtending an angular opening of 120° at the centre instead of the whole hemisphere of 180°.



Unit of Area = $\frac{1}{10,000}$ square inch.

FIG. 2.



Unit of Area = $\frac{1}{10,000}$ square inch.

FIG. 3.

IV.—NIGHT WORK.

(a.) *30-inch Reflector.*

This instrument is in good working order with the exception of the surfaces of the mirrors, which need resilvering, but the observers were fully occupied owing to the pressure of other work and the silvering has therefore been deferred. The roof of the house has been under repair for some time.

(b.) *6-inch Henry, with two prisms.*

The new mounting has proved eminently efficient and the instrument has been in continual employment.

The spectra of the following stars have been photographed:—

Andromeda	α (twelve plates)
Aries	α
Auriga	α (two plates)
Canis Majoris	α (four plates)
Canis Minoris	α (six plates)
Cygnus	α (nine plates) γ (two plates)
Gemini	β
Lyra	α (three plates)
Orion	γ (three plates) ε (two plates)
Perseus	α (two plates)
Ursæ Majoris	α (two plates) ε (two plates), η

With this instrument the attempt has been made to photograph, more especially, the green region F-D, with the object of obtaining better stellar comparisons for the sun-spot region which is observed visually at South Kensington. To this end various isochromatic plates have been tested, and the majority of the spectra have been photographed, with long exposures, on Wratten & Wainwright's "Verichrome" plates. The continued run of bad weather and the unfavourable situation of the instrument have seriously militated against this work. A series of spectra of α Andromedæ was obtained for the further investigation of the peculiarities of this star as discussed in a former paper.

(c.) *9-inch Prismatic Reflector.*

Since the date of the last report, photographs of the spectra of the following stars have been obtained:—

Aries	41
Canis Major	α
Cepheus	ξ (two plates)
Draco	γ
Orion	π_5 (two plates)
Perseus	o

(d.) 6-*inch Dallmeyer and Calcite Prismatic Camera.*

Both these instruments, which are on the same mounting are in good working order, and the spectra of the following stars have been obtained, each pair being on the same plate.

ε Orionis. α Leonis.	γ Leonis. α Cassiopeiæ.
β Leonis. α Boötes.	β Pegasi. α Pegasi.
α Boötes. α Ursæ Majoris.	ε Cygni. α Arietis.
α Ursæ Majoris β Ursæ Majoris.	α Aquilæ. α Pegasi.
α Boötes. β Geminorum.	γ Persei. δ Cassiopeiæ.

ε Ursæ Majoris. β Ursæ Majoris.	α Arietis. α Tauri.
*γ Leonis. δ Leonis.	β Arietis. α Arietis.
ε Ursæ Majoris. ζ Ursæ Majoris.	α Persei. δ Cassiopeiæ.
γ Orionis. ε Orionis.	*γ Orionis. α Orionis.
β Cassiopeiæ. η Ursæ Majoris.	α Canis Minoris. δ Orionis.

* Two plates.

(e.) *36-inch Reflector.*

The instrument is in good working order, but the nights suitable for its use have been very few during the year, though many attempts were made to secure adequate exposures, the instrument being kept constantly in perfect adjustment. The following spectra have been obtained:—

Orion Nebula (two plates).

An exposure of 3 hours was made on the spectrum of the Orion nebula with a special plate made by Messrs. Wratten & Wainwright. This was sensitized so that the region of maximum sensitiveness was at λ 5000, near the position of the chief nebula line. The photograph shows the three nebula lines at 5007, 4959, and 4861 of much greater intensity than has hitherto been possible with the dispersion employed.

(f.) *Meteors.*

Unfavourable weather conditions entirely prevented any systematic observations of either of the principal meteor showers in August and November.

(g.) *Distribution of Instruments.*

During this year the instruments have been distributed as follows, the observers for each instrument taking alternate nights.

Instrument.	January—December.
36″ reflector - - - - -	Dr. W. J. S. Lockyer. Mr. C. P. Butler.
6″ Henry Prismatic Camera - -	Mr. F. E. Baxandall. Mr. W. E. Rolston.
Calcite „ „ - -	Mr. W. Moss. Mr. T. F. Connolly.
9″ Reflecting „ „ - -	Mr. H. E. Goodson.

(h.) *Observing Nights.*

The state of the weather for observing purposes, from January to December, 1907, inclusive, was as follows:—

Month.	No. of Nights available.	No. of Nights Observers attended.	No. of Nights partially bad.	No. of Nights wholly bad.
1907.				
January	27	8	6	19
February	24	8	5	16
March	26	14	9	12
April	26	9	8	17
May	27	12	7	15
June	25	6	4	19
July	27	12	5	15
August	27	11	4	16
September	25	11	7	14
October	27	11	5	16
November	26	8	2	18
December	26	10	7	16
Totals—1907	313	120	69	193
1906	313	122	84	191
1905	312	98	—	214
1904	314	133	—	181

Nights designated "partially bad" in the above table are those on which the observers attended but no successful exposures were made.

V.—Transit of Mercury.

A full photographic programme was arranged for the spectroheliograph, including photographs of the sun's limb, before the first and after the fourth contact, in the hope of registering Mercury projected on the chromosphere. A programme of visual observations, direct and spectroscopic, was also planned. Bad weather, however, entirely prevented observations.

VI.—Computations and Investigations.

(a.) *Correlation of Solar and Terrestrial Phenomena.*

Much time has been spent by the computing staff in collecting, abstracting and preparing for use published data of the observations of solar and terrestrial phenomena; these have been arranged in convenient form, along uniform lines, for discussion.

Considerable time has also been occupied in preparing for press the pressure data of 73 selected stations, the publication of which has been undertaken by the Solar Physics Committee.

(b) *British Stone Circles.*

An investigation as to the astronomical origin of the Ancient Stone Monuments which are scattered up and down the country, more especially of those situated in Cornwall, Devon, South Wales and Aberdeen, has led to the general conclusion that these circles, cromlechs, avenues, &c., were erected as observatories for the determination of time and season by the observation of the sun and stars. The results of the investigation indicate that the dates of erection lie between 2,000 B.C. and 800 B.C.

VII.—Miscellaneous.

At the meeting of the Solar Union at Meudon on May 20th—25th the Solar Physics Committee was represented by the Director of the Solar Physics Observatory.

During the year photographs and diagrams have been lent for exhibition on the following occasions:—

The Royal Society's Conversaziones, May 8th and June 19th.

The De la Rue Coronagraph complete, including accessories has been loaned to Mr. F. K. McClean.

Visits were paid to the Observatory by:—

J. M. Baldwin, Melbourne, Australia.
A. H. G. Dawson, Ceylon.
E. Houghton, Florence, Italy.
Otto J. Klotz, Ottawa, Canada.
Wilhelm Krebs, Utrecht, Germany.
Hermann Strœle, Neuchatel, Switzerland.
Prof. Dr. C. K. Charlier, Lund, Sweden.
Dr. Josef Dinkhauser.
Capt. J. Sydney Henderson.
Capt. Johnston, Ordnance Survey.

VIII.—Instruments.

In addition to the instruments mentioned in previous reports the following are now at the disposal of the Committee:—

Three single lenses, foci 3″, 4″ and 5″.
Three spring bows.
Magnifying glass, 3″ diameter.
Set of circular steel punches, repaired and made complete.
Six-plate Wimshurst Machine.
Two 4-inch ball bearings.

IX.—Papers Published or in Preparation.

(1.) The following papers have been published since the date of the last report :—

"Spectroscopic Comparison of Metals present in certain Terrestrial and Celestial Light Sources (with special reference to Vanadium and Titanium), undertaken at the Solar Physics Observatory under the direction of Sir Norman Lockyer, K.C.B., LL.D., Sc.D., F.R.S." S.P.C. Publication. 29th May, 1907.

"Report of the Solar Eclipse Expedition to Palma, Majorca, August 30th, 1905." Being an account of the observations made by the Solar Physics Observatory Eclipse Expedition, and the Officers and Men of H.M.S. "Venus," at Palma, Majorca. S.P.C. Publication. 2nd October, 1907.

"On the presence of Sulphur in some of the Hotter Stars." By Sir Norman Lockyer, K.C.B., LL.D., Sc.D., F.R.S. Communicated May 8th. *Proc. Roy. Soc.*, A., Vol. 80, pp. 50–56.

"Note on the Permanency of some Photo-visual lenses." By William J. S. Lockyer, M.A., Ph.D., November, 1907. Monthly Notices, *Roy. Ast. Soc.*, Vol. LXVIII., No. 1., pp. 19–29.

(2.) The following papers are ready for publication or in the press :—

"On the general Spectra of certain Type Stars and the Spectra of several of the Brighter Stars in the Green Region." Results of an investigation made at the Solar Physics Observatory, South Kensington, under the direction of Sir Norman Lockyer, K.C.B., LL.D., Sc.D., F.R.S. S.P.C. Publication.

"Monthly Mean Values of Barometric Pressure for 73 Stations over the Earth's Surface," being a comparison of barometric variations of short duration at places widely distributed. S.P.C. Publication. (In the press.)

"The Spectra of the Sun (Fraunhoferic), Chromosphere, and the Lower Type Stars in relation to the Sun-Spot Spectrum." Results of an investigation made at the Solar Physics Observatory, South Kensington, under the Direction of Sir Norman Lockyer, K.C.B., LL.D., Sc.D., F.R.S. S.P.C. Publication.

"Prominence & Coronal Structure," by W. J. S. Lockyer, M.A., Ph.D., F.R.A.S. Communicated to Royal Society, November 30th, 1907.

"On the Observations of Sun and Stars made in some British Stone Circles. Third note. The Aberdeen Circles." By Sir Norman Lockyer, K.C.B., LL.D., Sc.D. F.R.S. Communicated to the Royal Society.

(3.) The following papers are nearly ready for publication:—

"Discussion of the Widened Lines of Various Elements recorded in the Sun-spot observations 1879–1903."

"Unorigined Lines in Celestial Spectra."

(4.) Some of the papers now in hand are as follows:—

"Complete Discussion of the Observations on Nova Persei."

"The Spectrum of γ Cassiopeiæ."

"On the Occurrence of Enhanced Lines in Arc Spectra."

"The Spectrum of P. Cygni."

"The Enhanced Lines of Metals of Low Atomic Weight."

"Further Observations on the Spectra of Meteorites."

"Observations of β Lyræ."

"The Order of Appearance of Chemical Substances in Nebulæ."

"Solar Prominence Reductions."

"The Short Period Barometric Pressure Variation and its Relation to Rainfall."

"Barometric and Rainfall Variations in Australia."

X.—Solar Physics Committee Publications.

Below is given the list of the publications of the Solar Physics Committee since its appointment in 1879.

Date of Publication or Distribution.	Title.
1880 - - -	"Preliminary Report of the Committee on Solar Physics."
1882 - - -	"Report by the Committee on Solar Physics."
1889 - - -	"Second Report by the Committee on Solar Physics."
March, 1892 -	"Position and Areas of Sun-spots and Faculæ, 1878–1881."
October, 1900 -	"Spectra of Sun-spots, 1879–1897."
May, 1902 - -	"Catalogue of 470 of the Brighter Stars."
November, 1902	"Areas of Sun-spots, 1832–1900."
February 13, 1905	"Mean Annual Variations of Barometric Pressure and Rainfall."
May, 1906 - -	"Tables of Wave-lengths of Enhanced Lines."
May 29, 1907 -	"A Comparison of Metals present in certain Terrestrial and Celestial Light Sources."
October 2, 1907 -	"Report of the Eclipse Expedition to Palma, Majorca, August 30, 1905."

Besides the foregoing, the following publications, have been issued by the Royal Observatory at Greenwich, by arrangement with the Solar Physics Committee:—

Date of Publication or Distribution.	Title.
July, 1889 -	"Position and Areas of Sun-spots and Faculæ, 1887."*
„ „ -	" „ „ „ „ 1888."
June, 1891	" „ „ „ „ 1889"
November, 1892	" „ „ „ „ 1890."
March, 1894 -	" „ „ „ „ 1891."
„ 1895 -	" „ „ „ „ 1892"
July, 1896 -	" „ „ „ „ 1893."
February, 1899 -	" „ „ „ „ 1894."
„ „	" „ „ „ „ 1895."
„ „	" „ „ „ „ 1896."
„ „	" „ „ „ „ 1897."
April, 1901 -	" „ „ „ „ 1898."
June, „	" „ „ „ „ 1899."
„ 1904 -	" „ „ „ „ 1900."
„ „	" „ „ „ „ 1901."
April, 1905 -	" „ „ „ „ 1902."
May, 1906 -	" „ „ „ „ 1903."
August, 1906 -	" „ „ „ „ 1904."
January, 1907 -	" „ „ „ „ 1905."

* The previous volumes of Positions and Areas of Sun-spots issued by the Greenwich Observatory date from 1874.

XI.—Personnel.

At the end of the period covered by this report the staff was constituted as follows:—

Sir J. Norman Lockyer, Director.
Dr. W. J. S. Lockyer, Chief Assistant.
Mr. F. E. Baxandall, First Assistant.
Mr. C. P. Butler, Second Assistant.
Mr. W. E. Rolston,
Mr. W. Moss,
Mr. T. F. Connolly,
Mr. H. E. Goodson,
} Computers.

Mr. J. P. Wilkie is occupied with the photographic reproductions.

Mr. T. Mills, Laboratory Assistant, and Mr. G. Bendall helped the observers in the night work, and during the day attended to the mounting of the solar photographs, cataloguing of negatives, the cleaning of the various instruments, and the minor repairs necessary from time to time.

XII.—Constitution of the Solar Physics Committee.

Sir William de W. Abney, K.C.B., D.C.L., D.Sc., F.R.S.
Sir William H. M. Christie, K.C.B., M.A., D.Sc., F.R.S. (Astronomer Royal).
Sir G. H. Darwin, K.C.B., M.A., F.R.S.
Sir John Eliot, K.C.I.E., M.A., F.R.S.
Mr. J. Larmor, M.A., D.Sc., LL.D., D.C.L., Sec. R.S.
Sir J. Norman Lockyer, K.C.B., LL.D., Sc.D., F.R.S.
Mr. H. F. Newall, M.A., F.R.S.
Mr. F. G. Ogilvie, C.B., M.A., B.Sc.
Mr. W. N. Shaw, M.A., Sc.D., F.R.S.

Secretary,—Mr. Frank Rede Fowke.

BOARD OF EDUCATION.

THE VICTORIA AND ALBERT MUSEUM (ART DIVISION).

REPORT

OF THE

COMMITTEE OF RE-ARRANGEMENT.

(Adopted July 29th, 1908.)

Presented to Parliament by Command of His Majesty.

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THE

VICTORIA AND ALBERT MUSEUM

(ART DIVISION).

Report of the Committee of Re-arrangement.

(Adopted July 29th, 1908.)

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Report of the Committee of Re-arrangement.

(Adopted July 29th, 1908.)

TO THE RIGHT HONOURABLE WALTER RUNCIMAN, M.P., PRESIDENT OF THE BOARD OF EDUCATION.

SIR,

WE have the honour to submit the following Report in respect of the various matters referred to us.

PART I.

INTRODUCTORY.

1. THE APPOINTMENT OF THE COMMITTEE, AND THE TERMS OF REFERENCE.

The Committee of Re-arrangement for the division for art of the Victoria and Albert Museum were appointed in February 1908, and their first meeting was held on the 20th of that month. The nature of the duties with which they were charged by the Board of Education was defined in the following Memorandum :—

1. The object for which the Committee is appointed is the preparation of a scheme of arrangement for the whole of the Art Museum which will provide the greatest facilities for study primarily to those interested in the commercial manufacture of objects of a kind represented in the collection—craftsmen, designers, manufacturers, and students ; and secondarily to those interested in Art without regard to its relation to industrial production—artists, students of art, of history, of manners and customs.

2. The Museum was originally founded as an instrument for stimulating the improvement in this country of such manufactures and crafts as require and admit of decorative design. In adding to the collections, however, the precise nature of its original purpose has not been throughout rigidly observed, and while the character imposed upon it at its foundation has continually influenced its development, its scope has become more extensive and less defined.

3. It has thus come about that the Museum lacks a clear definition of function, and while certain of the collections—as, for instance, those of pottery, furniture, metal work, glass, &c.—are calculated to afford instruction and assistance of the greatest value to those engaged in the commercial production of such objects, other collections, such as those of paintings and of sculpture, serve a purpose of a highly educational character indeed, but of a different kind and responding to a different need.

4. The Board are now anxious to secure that the precise purposes intended to be fulfilled by the Museum shall be clearly realised and co-ordinated. They do not suggest that it is possible absolutely to differentiate between the particular educational utility of one branch of the Museum collections and another ; on the contrary, they are inclined to think that the proximity of collections containing some of the greatest artistic treasures of the world to those bearing directly upon the particular subject which a student desires to study, is calculated to widen his intellectual horizon and to be of the utmost educational value. They do, however, conceive it to be essential, if the full utility is to be derived from the Museum for the nation at large, that it should in future be clearly realised that there is a fundamental difference of principle between the two purposes served by the Museum collections, and that the existence of those purposes should be accepted as a factor in determining the arrangement of the collections ; the one, the direct practical purpose of stimulating the craftsman and manufacturer and inspiring the designer and student who is engaged in the

production of objects of modern manufacture, and the other, the spread of a knowledge and appreciation of Art in its widest and deepest sense.

5. The Board, therefore, desire that the Committee (*a*) should prepare their proposals for the re-arrangement of the collections on the basis of these two principles, and (*b*) should indicate the lines on which the Museum should in their opinion be developed in future, having regard to the observance of these principles.

(Signed) Robert L. Morant.

2. The Intention of the Board of Education in Appointing the Committee.

At the first meeting of the Committee, Sir Robert Morant attended on behalf of the President of the Board and explained in further detail the intention of the Board in appointing the Committee. In the course of his remarks Sir Robert stated that "in the past the Museum had been developed "along very broad and indefinite lines, and without any very clearly "realised purpose. For some time the Board had desired to secure that, "in future, a clear policy of development should be followed, and for this "purpose they had had in view the appointment of a permanent Council "whose duty it would be to advise the Board as to the policy of purchases, "and generally in regard to all questions affecting the Museum, such as "the circulation of objects and the extension of the collections, &c.

"In considering the constitution of this Council, however, the Board had "arrived at the conviction, firstly, that it would be better to appoint a small "temporary Committee for the precise purpose of advising them as to the "re-arrangement of the collections, and secondly, that it would be a great "advantage, when appointing the permanent Council, to have the benefit of "any suggestions which such a Committee would be able to offer them in "the light of the information they might acquire in preparing their scheme "of re-arrangement.

"The Board had therefore included in the reference to the Committee "the rather vague phrase quoted [clause 5 (*b*) of 1 above], so that in "preparing their scheme of re-arrangement the Committee might always "bear in mind the ultimate direction in which they consider the Museum "should develop, and be free to obtain any information bearing thereon "that they desire.

"In this way, the Board hoped that the Committee might be able to offer "them suggestions which would subsequently be of the greatest value when "the Board came to constitute the permanent Council."

3. The Problems before the Committee.

The Committee were thus charged with the double duty of preparing a scheme of arrangement and of advising as to the principles which should guide the future development of the Museum. From the outset it became apparent that these two questions were inseparably connected, and that to arrive at a satisfactory scheme of arrangement it was essential that the principles on which the Museum was in future to be conducted should first be clearly laid down. Indeed as they have proceeded with their work they have found it necessary to devote a considerable proportion of their time to the questions of organisation and future development in order that the purpose and function of the Museum should be clearly reflected in the scheme of arrangement.

4. The Policy of the Museum in the Past.

As pointed out in the Memorandum defining the duties of the Committee, the Museum has always been intended, primarily, for the assistance of those engaged in the production of objects in which design forms an essential part; but the absence of any definition of the principles which should be followed for the attainment of this end left so large a field open to the Museum that objects other than those which would be included in the term "decorative art" have been admitted to its galleries by purchase as well as by gift. The initial latitude thus enjoyed by the Museum at a time when the competition between the different nations of Europe for the formation

of collections had not yet become so keen as it now is, enabled the Museum to form a magnificent collection of objects, some of the most precious of which would probably not have been acquired for this Museum had a more strict interpretation been placed upon its functions. While this can only be a matter of congratulation to the country, it is now necessary that a careful classification should be made of the collections so that the greatest advantage can be derived from them by the public at large, by those specially concerned with the application of Art to manufacture, and by students of the history and development of Art.

5. The Extent of the Inquiry.

The procedure of the Committee in planning their work has necessarily been largely determined by the fact that, owing to the approaching completion of the new buildings, and the consequent necessity for deciding various structural questions, the Board of Education desired to be in possession of their recommendations by the end of July. It was evident that in the comparatively short space of time thus available it would be impossible for the Committee to prepare a detailed scheme of arrangement for all the collections in the Museum. Moreover, it is obvious that the actual arrangement of the objects themselves in the galleries allotted to their exhibition depends upon a number of elements which cannot be adequately taken into consideration until experiments can be made in the galleries themselves, so that every advantage may be taken of effects of light and of environment. For these reasons the Committee resolved to confine themselves in their scheme of re-arrangement to classification of the collections, the disposition throughout the building of the main divisions of the collection in due relation to one another, and the main lines upon which the subsections of those divisions and the objects comprised in them should be disposed.

In addition to this the Committee have endeavoured to indicate the lines on which the work of this Museum should, in their view, be developed so as to observe a clear differentiation of function from that of the other National Museums in London and to establish a recognised area of activity for this Museum in the future.

6. Arrangement of the Report.

For the sake of convenience, and in order more clearly to explain the reasons for the system of arrangement which they have adopted, it will be best to deal in the first instance with certain matters of internal administration (Part II.), and with the general questions which it has been necessary to consider for the purpose of obtaining a clear conception of the functions which the Museum should in future aim at performing, and of its relation to other museums in London (Part III.).

The way will then be clear for the general discussion of the scheme of classification which the Committee think best suited to carry out the aims which the Museum is intended to fulfil (Part IV.); and, finally, for the more detailed recommendations of the Committee as to the arrangement of the collections in the separate sections of the Museum (Part V.).

PART II.

INTERNAL ADMINISTRATION OF THE MUSEUM.

Of the matters of internal administration which affected the disposition of the galleries of the Museum building, there were three important questions on which decisions as to future policy were to some extent necessary before the scheme of arrangement could be finally proceeded with:—(1) the offices of the expert staff of the Museum; (2) the relationship of the section charged with the circulation of objects in the provinces to the Museum, and the provision of space for the National Competition; (3) the disposition of the India Museum collections.

1. Keepers' Offices.

(a) *Proposed Accommodation for the Keepers outside the Museum Buildings.*

Prior to the appointment of the Committee it appears to have been contemplated that when the new building was brought into occupation offices for the Keepers and their staffs would be provided in the offices until recently occupied by the administrative staff of the Technological Department of the Board of Education. Therefore no provision had been made for Keepers' offices in the new building.

(b) *Defects of the proposed Arrangement.*

The Committee were of opinion that such an arrangement would be most unfortunate. If it were carried out, not only would the Director of the Museum and all the Keepers and their staff not be placed in the Museum of which they were in charge, but they would be placed at a considerable distance from the collections for which they will be respectively responsible. The extent of the Museum when completed will be very great; the distance of one part from another considerable; and if the technical officers in charge were placed wholly outside it, such inconvenience would be caused to those desiring information in regard to the collections as to gravely diminish the educational value of the Museum, while, from the point of view of the keepers themselves, the disadvantage of being separated to such an extent from the collections among which they must be continually occupied is almost equally serious. The Committee were aware that it is not the universal practice in great museums to house the Keepers in immediate proximity to the collections of which they are in charge. They may, however, point out that for many years past this has been the practice at the British Museum with most satisfactory results, and that at the Louvre the inconvenience of having all the offices concentrated in a single block of the Museum has been felt to such an extent that arrangements are in contemplation for providing an office close to the collections of each department to be occupied in rotation by the members of the departmental staff.

(c) *Modification of the proposed Arrangement.*

The views of the Committee on this subject were placed before the Board of Education, who gave them the most sympathetic consideration, and stated that they would be prepared to accept the Committee's view and to act upon it should it still prove possible to provide the necessary offices in the new building.

Accordingly, as soon as the Committee had determined the main lines of the allocation of the different departments and had arrived at the amount and nature of accommodation which they considered requisite for each department, the Board proceeded to consult H.M. Office of Works on the subject. Since then it has been a source of satisfaction to the Committee to learn that the First Commissioner entered into this question with interest and that he has been able to find means to provide accommodation for the purpose.

2. Circulation Department (including the National Competition).

(a) *Space proposed to be occupied by the Circulation Department.*

Before the appointment of the Committee it had been proposed to place the Circulation Department in the south-west corner of the new building on the lower ground floor, but the matter was still awaiting a final decision.

(b) *Situation of the Department dependent on its relation to the Museum.*

The Committee were of opinion that the situation to be assigned to this department in the new arrangement of the Museum was a question which largely depended on the policy to be adopted in regard to its future relation to the Museum. If it were to continue an integral part of the Museum it is clear that it should be placed within the Museum itself in a convenient

position for effecting a constant interchange of objects with the different sections of the Museum.

If on the other hand this department is to be made, more or less, administratively separate from the Museum, possessing a large separate collection which would render it almost independent of the main collection, the chief consideration to be borne in mind in assigning space to it is convenience of access for the wagons which must continually be loaded and unloaded at its doors.

Some investigation into the relations of this department to the Museum was therefore necessary in order that the Committee might be able to place before the Board their views in regard to the place to be allotted to it in the scheme of re-arrangement.

(c) *Conclusions of previous Committees in regard to the connection between the Department and the Museum.*

Considerable attention was devoted to the question of circulation by the Select Committee of the House of Commons which enquired in 1897–98 into the organisation of the Museums at that time controlled by the Science and Art Department. It would be beyond the reference of this Committee to deal with the results of those enquiries in regard to circulation as a whole; but in respect of the future relation of the work of this section to that of the Museum it is interesting to note the following paragraph in their report:—

> "It will probably be found necessary to make Circulation as distinct as possible from the Museum, giving it a special Vote in the Estimates, and an expert Keeper not subject to removal from one section of the Museum to another, into whose charge all available duplicates should be given."

In 1900 the work of this section was again enquired into by a Departmental Committee on the reorganisation of the Science and Art Department, which was rendered necessary by the constitution of the Board of Education, and the following paragraph indicating the possibility of the formation of separate collections for the purposes of circulation occurs in their report:—

> "We are inclined to think that, while it will probably be desirable that the head of the circulation division should be chosen from the general staff of the Art Museum, that division should be regarded, not as supplying expert advice, but as an intermediary between local authorities and the Museum experts, and as a practical authority for the business side of the circulation system, such as packing and transport. This arrangement would be facilitated if, as on other grounds appears desirable, a series of collections for circulation were arranged in all the principal branches of applied art; such collections should not be stereotyped, but should be constantly under revision, and it would always be possible to supplement them for some special occasion or particular locality."

Again in 1902 a small Committee composed of officers of the Board of Education gave expression in the following paragraph to a view very similar to that given by the Committee of 1900:—

> "With regard to the selection of objects for circulation it is found that collections representing one particular branch of art are rarely sought for; the Provincial Museums often asking for mixed collections, which, whilst forming more popular exhibits, are of less educational value. This practice appears undesirable and has necessitated the selection of fresh collections in almost every instance. We consider that, apart from their enhanced educational value, the work in connection with the selection of objects could be simplified by having lists prepared of objects typical of various branches of Art. These would be selected by the heads of the Art Museum sections, from the Museum collections and from the reproductions in circulation. When such selection has been made there will be no necessity for a fresh selection on each occasion; though it will be the duty of the heads of sections to see that these collections are from time to time brought up to date."

They further recommended that :—

> "The keeper in charge of circulation should also take charge of a section of the Art Museum in order that he may keep in touch with the technical work of the Museum and that he may be available for research work."

But they suggested that it might ultimately be desirable for this department to be placed in the charge of an officer who would direct all the administrative work of the section, and would be assisted by an expert Museum officer acting as intermediary between his section and the various technical sections of the Museum.

It is evident from these extracts that the possibility of rendering the Circulation Department independent of the collection on permanent exhibition in London had been present to the minds of the various Committees who had considered the question during the last few years.

(d) *Desirability of making the Circulation Department independent of the Permanent Collections.*

The members of the Committee were all strongly in favour of taking advantage of the re-arrangement of the Museum to form as rich a collection as possible for the use of the Circulation Department, so as to render that department independent of the collections on permanent exhibition and to remove the necessity for taking objects from the cases in the Museum for the purpose of lending them temporarily for exhibition in the provinces.

They therefore proceeded to investigate whether it was now possible for this to be carried out.

The Committee of 1902 had stated in their report that "a large collection "of objects is kept permanently in the Circulation Division for the exclusive "use of provincial schools and museums." Since the date of that report this collection has steadily increased, both in respect of reproductions and of original objects, until now a large proportion of the loans to provincial institutions is provided without recourse being had to the collections on permanent exhibition. Amongst various suggestions as to the lines on which the arrangement of the Museum should be made, Mr. Skinner recommended the formation of a subsidiary Museum composed of duplicates (not required for the general collection) and extra samples not really required for exhibition in the main Museum. He considered that in this way a really fine series could be gathered together for the use of country museums, and that this arrangement need not, of course, preclude the exhibition in the country from time to time of some object out of the main collection for some special reason. The Keeper in charge of the Circulation Department afforded further information on the subject, and indicated what additions should, in his opinion, be made to the existing collection. The Committee also had the advantage of discussing the subject with Sir Robert Morant and learnt that the Board of Education were anxious, if possible, to separate the administration of this section from that of the Museum, and to give it a greater opportunity of developing in accordance with the needs of the institutions with which it was connected. The Committee were further informed that if this separation were effected the organisation of the work in connection with the National Competition would most properly be entrusted to the officer in charge of Circulation, and that therefore for the purpose of arrangement these two questions should be considered together.

The investigations of the Committee thus showed that among those who had devoted attention to this subject there was a practical unanimity of feeling that it would be desirable that the objects placed on permanent exhibition should not be drawn upon, unless in exceptional circumstances, for the purpose of supplying the needs of "Circulation." It further appeared that for some years a policy had been pursued with the object of rendering "Circulation" as independent as possible of the collections on permanent exhibition; and that moreover by the addition of a number of objects, of value in themselves, but (owing to the richness of the collections in similar objects) not required for the permanent exhibition, this independence could now be made almost complete.

They have, therefore, proposed that this course should be followed, and that in the process of rearrangement the collections of the Circulation Department should be so developed as to render as rare as possible the temporary removal of objects placed on permanent exhibition.

(e) *Administration of the Circulation Department.*

With regard to the general administration of this section the Committee consider that while the officer in charge should certainly have a general knowledge of art, it should be clearly recognised that he is concerned with the general educational and administrative aspect of the relations between his department on the one hand and the Provincial Museums and Schools of Art on the other, but that in respect of the technical aspect of the work, he should be able to rely on competent expert advice. For this reason they have already expressed the opinion to the Board of Education that the present arrangement whereby a Keeper in charge of one of the principal sections of the Museum (that of Metalwork) is also in charge of the "Circulation Department," is not satisfactory; the duties of an expert Keeper and those of the officer in charge of what is essentially an administrative department appear to the Committee to differ so widely that, though the qualifications required for the efficient discharge of each may be found in the same officer, it is exceedingly probable that the demands on his energies will be so great as to make it impossible for him to do justice to both. For this reason they have recommended that the Circulation Department should become an administrative department separate from, but in touch with, the Museum.

(f) *Positions assigned to the Circulation Department and the National Competition.*

The principle of their recommendations as above explained being accepted by the Board, it was arranged in consultation with Sir Robert Morant to place the Circulation Department in the premises to the east, north and west of the Refreshment Room and to reserve the North Court for the purpose of the National Competition and its exhibition, and for other exhibitions which may be arranged by the Board of Education at South Kensington; the advantage of this arrangement being that the North Court can easily be cut off from the rest of the Museum without disturbing its ordinary work, and that it is well provided with means of communication from the private road to the north and east of the building, so that objects can easily be taken to and from the Court.

3. India Museum.

(a) *Amalgamation of the bulk of the Indian Collections with the main Collections.*

The Select Committee of the House of Commons on the Museums controlled by the Science and Art Department in 1898 expressed the opinion that the Oriental collections should be housed with the main collections on the east of Exhibition Road; and in 1902 a similar recommendation was made by the Departmental Committee. As a consequence of these recommendations, the new buildings appear to have been designed with a view to including the Oriental collections. Such an amalgamation being entirely in harmony with the main principles of your Committee's scheme of rearrangement, they were glad to learn that neither the Board of Education nor the India Office would raise any objection to it; and they have accordingly based their scheme on the understanding that the bulk of the Oriental collections now housed together in the galleries in the Imperial Institute Road will be distributed among their respective sections in the main building. In thus doing, they note the desire of the Board and of the India Office that all such objects should have indicated on the labels attached to them the fact that they belonged to that collection.

(b) *Utilisation of the Galleries at present occupied by the Indian Collections.*

When this transference of the Oriental collections is effected, the greater part of the space which they now occupy will be set free. The Committee understand that the future allocation of these galleries is not yet decided; and

they trust that in any arrangement the Board may now make for their disposal, due regard may be had to the possibility of their being presently utilised to provide space for the expansion of the Museum in the future.

PART III.

THE SCOPE OF THE VICTORIA AND ALBERT MUSEUM AND ITS RELATION TO OTHER NATIONAL MUSEUMS IN LONDON.

1. The Functions of the Museum as Defined by the Board of Education.

The instructions to the Committee clearly indicated that the Board of Education intended that this Museum should definitely be developed as a Museum of Applied Art. At the same time it was pointed out that at present the collections were not confined to objects which might strictly speaking be comprised in such a Museum as nowadays understood, and that advantage should be taken of such collections to increase the general educational utility of the Museum.

2. The Extent to which the Existing Collections fall within the Proper Scope of the Museum.

Before the Committee could prepare a complete scheme of classification and arrangement of the collections it was necessary for them to obtain a clear conception of the scope of the Museum and of the general lines upon which it could be most advantageously and logically developed.

The bulk of the collections have been acquired with the definite object of illustrating the development of design and craftsmanship, and no question could arise as to the propriety of their inclusion in this Museum. In their case the Committee could proceed at once to discuss and determine the system on which they should be classified and arranged. Since, however, it is these collections which give, and are intended to give, the Museum its special character, it is clear that the principles determined upon for their arrangement must form the foundation of the arrangement for the whole of the Museum.

The Committee therefore proceeded at an early stage to devote attention to the collection of Oil and Water-Colour Paintings, Miniatures, Sculpture, and Prints and Drawings, some portions of which might be outside the general scheme of arrangement for the decorative arts, and at all events do not admit of the application of similar principles of arrangement as may be applied to such collections as those of Metalwork, Woodwork, Textiles, &c.

3. Suggested Policy with regard to Collections outside the Proper Scope of the Museum.

(a) *Introductory Statement.*

Information was obtained from the Director and other officers of the Museum as to the historical reason for the formation of the collections named, and the practice now pursued in respect of the acquisition of additions to them. At the same time, with the approval of the Board of Education, the opportunity was taken for ascertaining to what extent collections of a character similar to those in process of formation at the Victoria and Albert Museum were being formed at other national museums in London. This course was determined upon for the reason that with the information thus acquired before them, the Committee would be in a position to judge whether any modification of the present practice was desirable and possible, and thus to make provision in their scheme of arrangement for the allocation of such space as seemed required under the conditions which they considered should prevail in future.

The results of this inquiry are stated in the following paragraphs.

(b) *The Origin of the Collection of Paintings and its subsequent Development.*

When the Museum was founded it does not appear to have been contemplated to include in it a collection of paintings. Indeed the title given to it at that time, Museum of Manufactures, would seem to preclude the inclusion of such a collection. When, however, after the transfer of the Museum from Marlborough House to South Kensington the offer of a large collection of pictures was made by Mr. Sheepshanks, it was evidently thought impossible to neglect the opportunity of acquiring so valuable an addition to the Museum. Mr. Sheepshanks' collection was accordingly accepted and the department thereby implicitly undertook the responsibility for forming a Collection of pictures of the British School for the foundation of which Mr. Sheepshanks presented his pictures. The Board have, however, only partially carried out the obligation they then assumed. For many years no additions were made to the collection of oil paintings, and the attention of the Lords of the Committee of Council on Education was drawn on more than one occasion by Mr. Redgrave, the sole conservator under the deed of gift of Mr. Sheepshanks' pictures, to the neglect to develope the collection. In a report made nearly twenty years after the collection had been presented to the department, Mr. Redgrave stated that the "implied promise to the late Mr. Sheepshanks that the "pictures included in his valuable gift should form the nucleus of an "historical collection of British pictures remained wholly unfulfilled as to "works in oil." In subsequent years, while Mr. Poynter and Mr. Armstrong were directors for Art in the service of the Science and Art Department, a small number of additions were made by purchase to the collection of oil paintings. In 1886 Lord Randolph Churchill, at that time Chancellor of the Exchequer, raised orally the question of the purchase of oil paintings of the British School by two National Institutions, namely, the South Kensington Museum and the National Gallery. Though no record has been kept of this action on the part of Lord Randolph Churchill, its effect was practically finally to put an end to the purchase of oil paintings by this Museum; examples only having been bought since that date when they have illustrated some phase of costume or have been executed for decorative purposes.

The Committee understand that oil paintings are occasionally lent for the use of Circulation, but that a number of pictures are permanently kept in that section for the use of provincial Museums, &c.

The case in regard to the development of the Collection of Water-Colours, also founded by Mr. Sheepshanks, is somewhat different. Many additions were made by bequest as well as by purchase, and by 1874 Mr. Redgrave was able to report that "The National Historical Collection of Water-"Colour Paintings . . . . has been so far completed as to allow "of chronological arrangement of the pictures for exhibition to the "public." Since then this collection has been continuously developed, and no doubt, owing to the fact that water-colour paintings were not purchased by the National Gallery, the formation of a representative historical collection of water-colours (including miniatures except those in oils) of the British School is at the present moment a recognised function of this Museum.

(c) *The Present Policy of the different National Museums in regard to the Purchase of Pictures.*

(i) *Oil Paintings.*

Oil Paintings are at present purchased by the National Gallery, the Tate Gallery, and the National Portrait Gallery. Sketches and studies in oils are also purchased by the British Museum. As has already been seen, a collection of paintings, mainly of the British School but containing also a few examples by foreign artists, exists at the Victoria and Albert Museum.

The aim of the National Portrait Gallery is entirely separate from that of the other galleries in that the subject rather than the art is the first consideration. It therefore does not concern us here.

In the case of the Tate Gallery (National Gallery), however, the intention of the donor appears to have been practically identical with that of Mr. Sheepshanks in founding the Gallery at the Victoria and Albert Museum. Both desired to stimulate the formation of a Collection of the works of British Painters. The official title of both Institutions is almost identical, that of the former being "National Gallery, British Art", and of the latter "National Gallery of British Art". Here then exists a duplication of function in regard to which the Committee desire to offer certain suggestions.

(ii) *Water Colours.*

With regard to water-colour paintings, while the Victoria and Albert Museum aims at the formation of a historical collection of British paintings as finished specimens of the art, the British Museum, in pursuance of its object of illustrating the sketches and studies of artists of all schools and all manners, necessarily endeavours to acquire a certain proportion of water-colours. The National Gallery has a collection of water-colours acquired by gift and bequest, but it does not purchase them either on behalf of the Gallery in Trafalgar Square or of the Tate Gallery. The present position then is that while water-colours, whether British or foreign, are accepted if presented or bequeathed to the National Gallery or the Tate Gallery, they are not purchased by them, and therefore collection by purchase is confined to the British and the Victoria and Albert Museums.

(d) *Suggestions as to Future Policy.*

After the above examination of the functions of the different Museums it may be well to summarise them as follows :—

(i) The Victoria and Albert Museum possesses a collection of oil paintings of the British School and a few of other schools, but has long ceased to acquire oil paintings as such.

(ii) The Victoria and Albert Museum collects by purchase and otherwise water-colours of the British School.

(iii) The National Gallery acquires oil-paintings and possesses a collection of water-colours, but it does not purchase them ; and the policy there in respect of water-colours has hitherto been to accept gifts of British examples for the Tate Gallery but otherwise to encourage the extension of the series at South Kensington.

(iv) The Tate Gallery, although a national gallery of British art, does not purchase water-colours of the British School, and is withheld by the terms under which the gallery was given from acquiring water-colours of foreign schools ; although at some future time the extension of its premises would enable it, if necessary, and if funds were forthcoming, to do so, as any such extension would not be subject to the conditions of the Tate building, and therefore not limited to British works alone.

(v) The British Museum aims at illustrating the methods of artists in their sketches and studies of all kinds, and thus acquires examples —not finished specimens—of both oil and water-colour paintings.

Viewing this position from the point of view of the Victoria and Albert Museum, the Committee desire to submit the following considerations :—

In the first place, they feel that the inclusion in the Victoria and Albert Museum of paintings which have no direct bearing on any of the applied arts is anomalous. It is, moreover, clearly neither in the interest of art or of the public that a stationary collection of oil paintings by British artists should exist at South Kensington, while a similar collection is being formed by the Tate Gallery—an institution founded for this very purpose, and in the complete fulfilment of which it is naturally hampered by the existence of many important examples at South Kensington. Similarly, with regard

to water-colour paintings, the present practice is equally unfortunate, owing to the fact that while the Tate Gallery is prevented, through want of funds, from collecting water-colours (which form a most important section of the art for the exhibition of which the gallery exists) a collection is in process of formation at a Museum of Industrial Art, to the main work of which it has no direct relation. These facts appear to the Committee to constitute a sufficient reason for a real endeavour being now made for the introduction of a change which will secure a more reasonable distribution of the functions of the different museums. With this object in view, they recommend that the question of transference of the existing Collection of Oil Paintings to the National or Tate Gallery be seriously considered, and that similar action be taken in respect of the Water-colour Collection, subject to the condition that some guarantee be first obtained for the extension and development of the admirable collection already formed at South Kensington.

The Committee are aware that in the case of a number of the bequests, including that of Mr. Sheepshanks, which contains both oil and water-colour paintings, conditions exist which render an absolute transfer difficult, if not impossible. The Committee, however, understand that some of the Museum paintings are at present lent to other public galleries; and possibly the principle of a more or less permanent loan may be further extended as a solution of the legal difficulties in the way of transfer. Any change, however, that may ultimately be made in the existing policy can only be brought about after lengthy inquiry and negotiation, and the Committee feel that in the meantime it is desirable for the line of demarcation between the Victoria and Albert Museum, and the only other museum which is concerned with the acquisition of water-colours—the British Museum—to be clearly defined. They understand that the aim of the British Museum *is to illustrate the methods of Artists by Sketches and Studies of all kinds;* assuming this definition to be accepted, the natural scope of the Victoria and Albert Museum or of any institution to which its function in this respect might be transferred would be the *Collection of finished Paintings from the Artistic point of view and for exhibition.*

Finally, the Committee would point out that, in the event of it being found impossible to transfer, even on loan, certain of the picture collections from South Kensington, an opportunity might perhaps be found for the separation of the paintings from the main building without contravention of the terms of any bequest. For this purpose they would suggest the possible utilisation of a portion of the galleries shortly to be vacated by some of the Oriental collections in the Imperial Institute Road. The Committee understand that these galleries have been used for the purpose of exhibiting paintings, with satisfactory results, and that indeed the Cross Gallery was constructed largely with this object in view.

(e) *Miniatures in Water-Colours or Oils.*

Miniatures at present seem to be acquired at haphazard by all the different institutions, but collected by none. The great majority are of course portraits, but as a rule are not of sufficient importance to be included in the National Portrait Gallery. Inasmuch as they have no relation to applied art (except very incidentally, as subsidiary decoration of furniture, jewellery, &c.), it would seem that they ought to belong to either the British Museum or the National Gallery. The Committee think that of the two institutions, the British Museum would have the stronger claim to them, both as drawings and also as portraits in association with the large series of engraved portraits already housed there. Portraits as drawings would appear to fall naturally within the scope of the British Museum, while the National Portrait Gallery may be said to collect drawings as portraits.

(f) *Paintings in Fresco and other Mural Paintings.*

These would appear to fall naturally within the category of applied art; and as such they are properly included in the list which is given under the heading "Art Museum" in the *Regulations.* The British Museum does not

purchase such objects except in the Department of Classical or Oriental Antiquities; and the only other metropolitan institution which includes them is the National Gallery. Now it is obvious that the National Gallery, which aims at illustrating the historical and geographical development of painting, cannot afford to exclude this branch of the art, especially as it happens that, in many cases, entire schools have left us no other examples of their work.

The question thus arises, can a working policy be laid down which shall obviate any difficulty arising from the conflicting interests of the National Gallery and the Victoria and Albert Museum in regard to this class of objects? In this case the Committee are of opinion that the primary interest of fresco and mural painting being decorative, they should properly be assigned to the Victoria and Albert Museum, the National Gallery only taking those exceptional examples which it requires as examples of a particular master's work, or as filling a gap in the illustration of the historical development of painting.

(g) *Sculpture.*

The only other British metropolitan institution which at present undertakes the collection of sculpture* is the British Museum. Apart from that which comes naturally within the scope of the departments of Oriental and Classical Antiquities, the British Museum sets itself to acquire a certain amount of non-classical sculpture, but mainly from the point of view of ethnography; it has further a collection of sculpture from Buddhist topes (chiefly transferred from the India Office); and a series of sculptures which illustrate the history of religions; but the bulk of this sculpture is such as would properly be included in an ethnographical collection. Of Renaissance sculpture in marble, bronze, or stone, there is practically nothing of importance; on the other hand, there is a fine collection of ivory carvings, both of the Renaissance and the Far East, which undoubtedly overlaps one of the fields which has been hitherto covered by the Victoria and Albert Museum.

It thus becomes evident that at present the Victoria and Albert Museum is practically the only British metropolitan institution in which non-classical sculpture regarded as Fine Art finds a place. Although the scope of that institution, as defined by the Minute of 1863, does not properly embrace the collection of all such material, yet in view of the treasures which it already possesses of this class, and the indirect influence which fine sculpture exerts on all forms of applied art, it seems to be desirable that provision should be made in the Victoria and Albert Museum for the reception of works of art of this character.

It is obvious that a certain amount of sculpture belongs to the category of applied art, and as such would naturally find a place in the Victoria and Albert Museum; it appears indeed to be essential that specimens of such work should be included, if the Museum is to fulfil its principal purpose. It would appear therefore that funds of the Museum may properly be devoted to the purchase of objects to which this description applies. On the other hand, while statues and reliefs which have no function as applied art fall outside this category, the dividing line is often difficult to define, and there are certain advantages to be gained for students if the division is not too strictly insisted upon, and if the juxtaposition of both classes can be conveniently arranged.

The ideal arrangement might be that in which all the National collections of sculpture were co-ordinated in one building or in adjacent buildings. As this is for the present impossible, the Committee suggest that the Victoria and Albert Museum be meanwhile regarded as the home of all classes of sculpture which are not included in the British Museum collections referred to above; with the further provision that of post-Renaissance sculpture only such specimens should be included which may be selected as the most artistic examples of applied design.

* The small series of originals belonging to the Royal Academy, and those modern examples in the Tate Gallery chiefly purchased under the terms of the Chantrey Bequest, are anomalous cases which need not here be considered.

Applying this principle to the future policy of the Museum, the Committee would suggest that purchase of sculpture should be confined to such objects as have an important bearing on applied design; but that the Museum should accept such sculpture offered to it (whether by donation or loan) as fall under the classes just described.

(h) *Prints and Drawings.*

The section of Prints and Drawings has hitherto formed for administrative purposes a part of the Library; and, although it is at present estimated to contain upwards of 200,000 prints and 50,000 drawings, no arrangements appear to have been made for exhibiting any part of it. Owing largely to this fact, the existence of the collection seems to be insufficiently known, and its purpose generally misunderstood; its title is moreover unfortunate, inasmuch as it suggests overlapping more than is actually the case with the British Museum department of the same name.

The origin of the section may be traced to the purchase of examples for the use of students, by the Council of the School of Design, as long ago as 1837. In the course of time this original limitation of purpose seems to have been partially ignored, for the Board Minute of 12th July 1864 provided for two separate sections—one of "Modern Engravings and Etchings," the other of "Drawings and Engravings of Ornamental Designs." The Committee, however, are glad to learn that, although there is in the collection a certain number of prints and drawings which have no direct bearing on the applied arts (acquired largely by bequest), the present policy is against the purchase of such examples. They are of opinion that the scope of this section should be so far as possible confined to such examples as will supply illustration of the History and Development of Decoration and of the Applied Arts (including the various methods of Etching, Engraving, and Lithography).

The only other metropolitan institution which collects prints and drawings is the British Museum. For the purpose of comparing the respective scopes of the two Museums in this regard, it will be convenient to consider separately the two main sections into which the subject naturally divides itself—of *wood* and *copper*.

Wood engraving is largely an applied art, and in order to fulfil the principal aim of the Victoria and Albert Museum, a limited number of wood engravings and of objects sufficient to illustrate the various processes connected with the art should be housed there; these should not be costly or difficult to acquire. In cases where a class of wood engraving belongs wholly to an industry, such as that employed for textiles, the destination would naturally be the same. For all wood engraving on the other hand which belongs to Kulturgeschichte pure and simple, the British Museum is obviously the proper place. While this should be the controlling principle, a certain duplication is necessary to enable the British Museum to show such of the results of the process as illustrate its general collection of prints and drawings.

Copper engraving has very little bearing on applied art, except in so far as it provides printed models for all sorts of technical work; such prints, or at any rate such as may be absolutely required to illustrate the development of the applied arts, would naturally fall to the Victoria and Albert Museum, but the main series of copper engravings, as well as all illustrations of the process itself, would naturally be acquired by the British Museum, and within these limits care should be taken to avoid random duplication between the two institutions.

It will be understood that in either section the Victoria and Albert Museum should have a prior claim to all engravings which can be definitely described as engravings of ornament.

In view of the fundamental difference in scope between this section of the Victoria and Albert Museum and that of the Department of Prints and Drawings at the British Museum, the Committee propose that a "Department of Engraving, Illustration, and Design" be constituted separate from, but contiguous to, the Library. The detailed recommendations in regard to this new department will be found below, in Part V. of this report.

(j) *Medals and Plaquettes.*

The Committee have considered the question of the inclusion of these in the collection of the Metalwork Department, and are of opinion that it is desirable that a few examples should be exhibited in so far as may be required for the illustration of technical methods of production and design; but in view of the collection being formed at the British Museum, and of the facilities enjoyed by that Museum for the acquisition of modern medals, it is not desirable that a collection should be formed at the Victoria and Albert Museum.

(k) *Extent to which the Collections of different Institutions may reasonably overlap.*

As a matter of general principle, it is important that the scope of each of the metropolitan institutions dealing with objects of the same class should be clearly defined; but the Committee fully recognise that it is impossible altogether to avoid overlapping in detail. It will probably be found that while the full series of any given class of objects will properly be assigned to one institution, this need not prevent another institution from acquiring individual examples of the same class, merely for a subsidiary purpose, to serve as illustration of a series legitimately falling within its scope. If this principle be clearly recognised, such overlapping need present no difficulty.

PART IV.

SCHEME OF CLASSIFICATION.

1. The General Principles of Classification.

(a) *The Committee's Instructions on this Point.*

The instructions to the Committee intimated that their scheme of arrangement should provide primarily for the needs of those who used the Museum as a Museum of Industrial Art. They, accordingly, proceeded to consider the principles of classification of the collections which would be most suitable for this purpose.

(b) *The Opinions of various Authorities.*

On this question the Report of the Select Committee of the House of Commons, which sat in the years 1897–1898, merely records the need for some system of classification, but expresses no preference for classification by date, by country, or by material. On the other hand, the Committee of Reorganisation of the Education Department and Science and Art Department, which sat in 1899, expressed the opinion that it was desirable that "the collections should, as far as possible, be classified and arranged by "industries rather than by countries, as is, to a great extent, the case at "present." They believed, "that much convenience would result if this "change were made, as, if all objects illustrating particular branches of art "were grouped together, students would be able far more easily to carry "out their researches." This view, your Committee found, was also held by the Director of the Museum.

(c) *The Practice of Museums abroad.*

In addition to the collection of information relating to the systems of arrangement and organisation of Museums abroad special visits were paid by two members of the Committee to many of the Continental Museums. Of those which offer an analogy to the Victoria and Albert Museum and devote special attention to the exhibition of Industrial Art two of the principal Museums visited, the Oesterreichisches Museum für Kunst und Industrie at Vienna and the Kunstgewerbe Museum at Dresden were found to be in process of re-arrangement.

The former, which is now being greatly enlarged, will be rearranged (1) by materials and development of design and craft; (2) by historical rooms to show the interaction of design in different materials. The latter has just been re-arranged. It was desired to arrange it so as to show the history and development of each craft. From want of space and inadequacy of the collection this, however, did not prove possible. The bulk of the Museum is arranged according to material.

(d) *The General Nature of the Scheme proposed by the Committee.*

It was on this principle (that of classification by material) that the Committee finally decided to base their scheme, and, throughout the arrangement of the individual sections, to keep in view the two main principles of the development (*a*) of design, and (*b*) of methods of workmanship; and that the collections should be classified by materials as follows:—

A.
Movable Objects.

(1) Stone and marble.
(2) Metals.
(3) Enamels.
(4) Glass.
(5) Ceramics (including Schreiber Collection).
(6) Wood.
(7) Leather.
(8) Textiles.

B.
Structural or Fixed Objects.

(1) Stone and marble:—
  (*a*) Originals.
  (*b*) Casts and copies.
(2) Metal.
(4) Stained glass.
(5) Terracotta and stucco.
(6) Wood.
(9) Wall painting.
(10) Mosaic.

C.

(1) Paintings.
(2) Objects which cannot be included in the sectional arrangement.
(3) Collections which, by terms of bequest, may not be subdivided.
(4) Loan collections.

D.

Library, including Printing, Bookbinding, and Engraving.

E.

Circulation.

The Committee propose that the objects comprised in the Museum collections shall be arranged in eight departments, as follows:—

1. Architecture and sculpture.
2. Metalwork.
3. Woodwork, furniture, and leather.
4. Textiles.
5. Ceramics, enamels, and glass.
6. Paintings.
7. The Library.
8. Engraving, illustration, and design.

2. Considerations affecting the Allocation of Space to the several Collections.

(a) *Future Development.*

In considering the question of the allocation of space to the different sections, it was found that even with the large increase of accommodation afforded by the new buildings, and after taking into account a certain depletion of material which will naturally result from the separation of the Circulation Department, the amount of room now available is not more than suffices for present requirements with reasonable regard to expansion. For the Committee strongly hold that, in the arrangement of the various sections, the following principles should be always kept in view, namely,—

(1) There should be formulated for each section a reasonably logical scheme illustrating the technical and artistic development of the particular industry represented; and that scheme should, as nearly as possible, be adhered to in the arrangement of the specimens.

(2) Where specimens are not available for the complete illustration of the sequence of development, attention should be drawn to the deficiencies by means of drawings and photographs, with the view of substituting for these, as time goes on, actual specimens acquired by gift or purchase.

In other words, the arrangement should be based, not so much on the existing material, as with the view to the eventual formation of series which shall illustrate in each section the complete development of process and design. It will of course be understood that this principle can only be adhered to in the case of the smaller objects, and would be impossible in the case of the more bulky objects, such as belong, for instance, to the section of Architecture and Sculpture.

(b) *Relation of the Museum to Manufacture.*

In this connection, a further question arises in regard to the relation of the Museum to manufacture; that is to say, whether it is to be developed with the object of giving manufacturers and others the means of studying examples of all kinds of manufactures, modern as well as ancient, for the purpose of enabling the producers of this country to compete successfully with the producers of other countries; or whether it is to be developed with the object of illustrating and stimulating the growth of design and workmanship by means of the finest examples obtainable. The wording of the Museum Regulations (which are apparently based on the Regulations drawn up by their Lordships in 1863) is somewhat vague on this point; but it seems to have been clearly intended that the chief aim should always be to improve the artistic quality of British design and production.

For a Museum which is limited in its capacity both as regards acquisition and storage, it would thus seem essential to exclude objects which do not either (1) illustrate the development of technique or design, or (2) serve as examples of artistic taste in applied design.

In the past history of the Museum, a large number of objects has accumulated (not always by purchase) which fulfils neither of these purposes. In some cases objects have been acquired which at the time of acquisition had some commercial or historical interest, but of which the interest never had any relation to art, and has now ceased to exist. There are, for instance, certain Indian textiles now in the collection which are the reverse of artistic and are such as can be purchased to-day in any London warehouse. These very textiles are consulted by manufacturers with the purpose of making imitations of them. It is clear that such a use of the Museum was not contemplated in the Regulations; and the Committee would urge that the Victoria and Albert Museum is not, and never can be, a Museum of Commercial Products. A Metropolitan Museum of this kind is probably needed, in order to enable manufacturers and others to study the markets, and to learn how to adapt their goods to meet demands both at home and abroad. Some day such a Metropolitan Museum may be formed, perhaps under the Board of Trade. The distinction between it and the Victoria and Albert Museum would be that while the one would aim at the improvement of commerce from the commercial standpoint, the other aims at the improvement of the artistic side of manufacture.

The attempt to make the Victoria and Albert Museum combine both these functions has already, as the Committee understand, caused difficulties in the past; and if it be continued as a settled policy, it is likely to cause increasing difficulties in the future. Moreover, so long as the existing institution is supposed to cater for both objects, the formation of a Commercial Museum will be delayed. The Committee consider it important to lay down a definite line of policy as regards this question.

(c) *Acquisition of Modern Specimens.*

Closely allied with this subject is the question as to the inclusion of modern specimens. It may occasionally happen that manufactured objects of say less than 50 years old may convey valuable artistic lessons, either in the illustration of a new process, of a new application of material, or of the revival of an ancient process; and it would be impolitic to exclude altogether such objects from the scope of the Museum. On the other hand, it is obvious that the principle of admitting modern specimens presents grave difficulties; taste is apt to change with time; and the admission of the work of any one living manufacturer or craftsman would not improbably expose the administration to attack from others, and even to the charge of advertising for

ulterior ends. On the whole the Committee, after full consideration, are not disposed to make any definite recommendation on this point; but consider it would be better to leave such questions to be dealt with as they arise.

(d) *Difficulties in Connection with the New Buildings.*

Before proceeding now to discuss the general principles which have guided the Committee in their scheme of re-arrangement, it should be stated that, at the outset of the Committee's labours, Sir Charles Dilke personally expressed his strong opinion, both to the Committee and to the Board of Education, that certain structural features of the buildings, as already erected with the previous consent of all at the time concerned, would be found to render impossible, or at least difficult, the adoption of such an arrangement of the collections as would best carry out the purposes of the Art Museum.* The Committee concurred, and communicated their view to the Board. The Secretary of the Board thereupon informed them that the President was anxious the Committee should realise that the Board quite understood the possibility of difficulties arising, inasmuch as the structural disposition of the buildings might prevent them from arriving at a scheme of arrangement which would completely carry out the purpose they had in view.

The principal difficulties due to this cause which have confronted the Committee are the following:—

(1) The lack of any provision for the proper distribution of Departmental Offices, already referred to (in Part I.);

(2) The enormous increase in Court accommodation, which was already in the old building too large; since for the great majority of the objects comprised in the Collections, Galleries rather than Courts offer the only suitable conditions for exhibition;

(3) The absence of direct communication between the eastern and the western block of galleries on the first floor of the south front of the new building.

Under these circumstances it will be understood that the Committee's scheme is necessarily in the nature of a compromise; they have throughout endeavoured to formulate an arrangement of such a nature that the structural difficulties should interfere as little as possible with the leading principles which they regard as essential.

3. The Horizontal System of Arrangement Adopted in Preference to the Vertical.

Experience has shown that the average visitor to a Museum or Gallery is apt to look for continuity rather in the horizontal than in the vertical direction; that is to say, he prefers to find the different portions of any section which he may be studying arranged on one level, rather than separated by a staircase. The Committee have therefore adopted, so far as is possible, the horizontal rather than the vertical grouping of galleries, and this principal renders the structural difficulty on the South front (referred to above, No. 3) all the more regrettable.

4. The Question of Scale.

Another acknowledged principle of arrangement is the due consideration of scale; nothing is more unfortunate than the neglect of this principle, whereby it too often happens that large and small objects are placed in close proximity to each other. The Committee have therefore endeavoured to make the best of the large courts near the entrance by grouping in them, as far as possible, the objects of large dimensions, and with this view they have regarded these courts as the starting or converging points from which the different sections shall radiate.

* Sir Charles Dilke at the same time informed the Committee that the responsibility of the Architect and of the Office of Works appeared to be covered by the evidence of Major-General Sir John Donnelly (Q. 480, 1575, 1790, 1791, 7243-8 in the Minutes of Evidence taken before the Select Committee, Blue Book, No. 341, 1897).

5. The Plan of building Specimens into the Museum Structure.

In the arrangement of the existing Museum a considerable number of objects, such as Italian doorways and the Singing Gallery, are built into the museum structure in such a way that they often escape the notice of the visitor, and are inconvenient for study. The Committee think that this practice is, as a rule, unfortunate; such objects should be placed where they are most easily available for consultation by students, and no attempt should be made to suggest the position or surroundings (which must always be inadequate and misleading) for which such objects were originally designed. The utmost that can or should be done in such a case is to provide as near to the object as possible a model, photograph, or drawing of the building or position from which the detail in question has been removed.

6. The Geographical Arrangement.

It has been already stated that the leading principle of the Committee's scheme is that of illustrating the development of design and of methods of workmanship. The geographical arrangement, although it is not so consistent with the main purpose of the Museum, has also naturally to be considered, and even in some cases would appear to be the more instructive. The Committee have therefore endeavoured, wherever possible, to keep this system in view as a subsidiary principle. In the Architectural Court of large objects, where the material was insufficient and unsuitable for the leading principle of arrangement, the geographical order has been found more practical; but within this, the objects have been grouped as far as possible in chronological order, so that the departure from principle in this case is not of serious import. In the other sections the chief principle has been generally observed; but at the same time a system of parallel grouping will even in these cases permit of the geographical principle being largely suggested.

7. Guidance to the Public.

In making the system of arrangement clear to the public, much reliance must be placed on a full and intelligent employment of labels, giving cross-reference wherever necessary; on the multiplication of cheap catalogues and guide-books, and on the supplementary use of casts and photographs. It would also be desirable to arrange for a very liberal supply of plans of the buildings and printed suggestions, so as to give visitors all possible guidance in studying the collections.

8. The Question of Casts.

The question of casts has an important bearing on the policy of the Museum. The Museum already possesses a large and important collection of casts, mainly from architectural originals, which are at present housed in the Architectural Court. The Committee so far recognise the value of these that they propose to assign to them for the present, not only the space which they now occupy (and in which they are much overcrowded), but the adjoining East Court as well. This accession of space will permit of a re-arrangement of them on a more intelligible and useful principle; they will also, as thus placed, be adjacent to the series of architectural originals in the East Hall which they are intended mainly to illustrate.

It must be borne in mind, however, that the Museum is primarily a Museum of Originals, and that the proper function of the casts included in it is to supplement or fill gaps in the series of originals. In pursuance of this policy, certain portions of the casts formerly housed at South Kensington have been transferred to the Architectural Museum at Tufton Street and to the British Museum. On the other hand the Committee understand that a considerable extension of the collection of casts has been in contemplation, and that it had been proposed to fill the important East and West Halls with a series illustrating the development of British Architecture. Such a collection would no doubt be of great value in a suitable place, but the Committee feel that the attempt to make the Museum combine with its proper functions those of a Trocadero would be in every way disastrous. They therefore desire to express strongly their view that further additions to the existing collection of casts should not be

contemplated in the policy of the Museum, except in special instances where these are needed for illustrating or supplementing originals. They even hope that in the course of the natural expansion of the collections, the space at present allotted to the collection of casts may ultimately be more worthily filled by originals.

9. Photographs.

The Museum possesses a large collection of photographs which have hitherto been regarded as a section of the Library. The rules hitherto governing the formation and maintenance of this collection appear to be somewhat vague, and the Committee have thought it best to deal with the question in relation to their general policy as regards the Library (*see* below, Part V., page 35).

10. Bequests.

A considerable proportion of the collections in the Museum has been acquired by bequests under special conditions; and the Committee have found great difficulty in adjusting these collections to their scheme of re-arrangement. As a matter of policy, they are of opinion that care should be exercised in accepting collections under such conditions. They understand that in certain foreign Museums strict rules are laid down bearing on this question; and while they are unable to make any definite recommendation on the point, they think it right to call attention to the grave inconvenience that often arises in this way.

11. Loans.

At the present moment there are several important collections deposited on loan in the Museum. The Committee recognise the difficulties that may arise in the acceptance of such loans; such, for instance, as the necessity of keeping together an assortment of specimens of different classes, at the cost of interruption of the main scheme of arrangement; or again, it may sometimes happen that gaps in the Museum series remain unfilled in consequence of reliance on a loan collection which may in time be withdrawn. At the same time, such loan collections may eventually become the property of the Museum by donation or bequest, and the Committee feel that it would be impolitic to discourage them.

The regulations at present in force for the exhibition in the Museum of objects on loan are as follows:—

(1) Objects are received on loan for exhibition, with the approval of the Board of Education, for a period of not less than six months and not exceeding a year. At the expiration of the time the loan must be removed, unless the Board have agreed to exhibit it for a further period. Objects received on loan may be exhibited at either the Victoria and Albert or the Bethnal Green Museum, unless special agreement be made limiting them for exhibition at one or the other Museum.

(2) All possible care is taken of objects lent for exhibition, or submitted for purchase, but the authorities cannot be responsible for loss of, or damage to, objects.

(3) The cost of carriage to and from the Museum of objects accepted on loan is paid by the Board of Education.

(4) If it should appear that a representation of any object accepted for exhibition in the Museums is likely to be useful for instruction in Science and Art Schools, photographs, copies, or casts of it may be taken, unless the owner make an objection in writing within a week of its receipt; two copies of any photograph so taken will, however, be sent to the lender or, where the object has been presented, to the donor. Permission to copy, photograph, or measure objects on loan will not be granted to private persons without the written sanction of the lender.

The Committee, in planning their scheme of re-arrangement, propose that provision should be made for the exhibition of objects on loan, not in the Galleries with the permanent collections, but in a hall to be

known as the Loan Court. They are of opinion, however, that this principle need not preclude the temporary exhibition in each department of objects on loan which throw some special light upon the permanent collections.

12. Labels.

The importance of having a full and intelligent system of labelling has already been noted; the Committee further consider that the time has now come when the system at present in vogue of exhibiting on the labels the prices paid for purchased objects should be discontinued. The question was discussed, upon the evidence given, by the Select Committee of 1898, and the summary of their views is to be found on page lxv of their Report. Without deciding definitely for or against the practice, the gist of their opinion is given in the following words:—"We hold that if this system "(useful to the collector and student) be maintained, all objects should "be priced." The practice appears to be based upon a memorandum on labelling issued by Sir Henry Cole in 1863, which lays down, among other recommendations, that a label "ought to state the artist's or maker's name and the price"; but for some unexplained reason, an exception has been made in the case of oil and water-colour paintings. The Committee, on consideration, fail to see that the practice offers any sufficient advantages, while it is, in most cases, entirely misleading. They, therefore, recommend that the prices shall be removed from the old labels and omitted in those hereafter to be made.

13. New Acquisitions.

The Committee recommend that new acquisitions, whether by purchase or gift, should be separately exhibited in each department for a year before being incorporated in the collections.

14. Detailed Arrangement of Collections.

The Committee think that the present would be a good opportunity for thoroughly revising the whole of the sections in detail. If the proposed new scheme for the Circulation Department is carried into effect, some such revision of the objects at present being circulated will indeed be essential. It will probably be found that a considerable interchange of objects between the Museum and Circulation must be made.

As a preliminary measure, the Committee consider that in every section lists should be compiled dividing the collections into four categories, as follows:—

(1) The objects which it is considered essential to exhibit permanently;

(2) The objects which should probably be exhibited, but which it is not essential to exhibit;

(3) The objects which should be available, but not exhibited;

(4) The objects which could safely be transferred to the Circulation Department.

With regard to (2), it is probable that in many of the sections a method may be found (such, for instance, as is being adopted in the British Museum) for rendering the whole of this category available to the student (though not on permanent exhibition) without the intermediary of an official. The Committee have had before them designs of cases, based on various information received from Museums at home and abroad, and are of opinion that either with glass-topped drawers, or some arrangement of nests of frames, a system may be devised which will meet the requirements. But as each class of object needs to be treated from its own individual standpoint, the Committee think it is a matter which it would premature to settle now; it should rather be left as a general instruction to be carried out when the detailed re-arrangement of the collections is undertaken.

15. Cases.

In this connection it is necessary to direct the attention of the Board to the difficulties which the Committee have found owing to the apparent absence of any organised principle on which the cases for the Museum were ordered (and indeed partly constructed) before their appointment. The Committee believe that all modern experience has made it clear that, although no object should as a rule be exhibited in a case at a height of less than two feet from the floor, yet as economy of space in a Museum is always desirable, the greater part of this two feet may be usefully fitted with drawers or cupboards which would serve as valuable storage room, especially of the objects belonging to the same category as those exhibited above them. Moreover, it seems to be obvious that the circumstances of each section will probably require individual treatment in this respect. Yet neither of these considerations seems to have been taken into account. The Committee understand that a general order for all the galleries was given for a uniform type of case, mounted on a marble plinth, which renders such an arrangement of drawers as that above suggested impossible; and these marble plinths have already been fitted in some galleries (as, for instance, one allocated to carpets) where no wall cases will probably be required.

16. Electric Lighting.

The same absence of any thought-out scheme adapted to modern ideas is unfortunately to be noted in the provision for lighting. Here again it would have seemed unnecessary to state certain recognised principles, had not these been entirely overlooked in the wiring, which has already been carried out. It can hardly be disputed, for instance, that a Museum requires a special system of lighting, inasmuch as it is the objects on exhibition and their labels which need light, rather than the room in general. In fact, the principle should be laid down, that the gallery should be lighted mainly from the point of view of illumination of the specimens. Moreover, here again each separate class of object requires careful individual treatment.

The Committee found that the only provision made for the galleries was the uniform design of a series of groups of lights arranged in double rows along the axis of each gallery, hung near the ceiling.

They trust that it is not too late to alter this, at any rate to the extent of providing a run of lights immediately above the tops of the wall cases, which should be provided with glass tops and shelves.

PART V.

DETAILED RECOMMENDATIONS AS TO THE ARRANGEMENT OF SECTIONS.

1. Collections requiring special Treatment.

The general scheme of re-arrangement proposed by the Committee in regard to the allocation of space among the various sections is set forth in the appended plans of the building. Before proceeding to a detailed examination of each section, it is necessary to clear up one or two outstanding points, especially in regard to the collections which by terms of bequest require special treatment.

Jones Collection.—The Committee recommend that this collection remain in the rooms which it now occupies along the east side of the South Court. Inasmuch, however, as the collection is in their opinion unduly crowded in its present space, they propose that the needed space for its extension be provided by the assignment to it of the room now occupied by the pictures by Constable.

Dyce and Forster Collections.—The collection of books should be transferred to the rooms on the floor immediately above its present position (*see* page 34); the rooms thus vacated being devoted to the exhibition of the collection of pictures.

2. The Detailed Placing of Objects.

In submitting the following detailed recommendations touching each of the eight sections of the Museum, the Committee wish it to be understood that, although in every case they have laid down the main lines upon which they consider the collections should be arranged, they cannot at this stage indicate the precise position of every object, nor indeed of all the groups of objects. Any attempt to do this at the outset, even if it were possible, would inevitably be found to require modification in the process of actual moving; a certain elasticity must necessarily be provided, and the Committee think that some measure of discretion in detail must be left to the several officers who will be ultimately responsible.

3. Architecture and Sculpture.

East and West Halls.

In accordance with the general scheme of the Committee, these halls were assigned for the arrangement of Architectural originals principally of stone and marble.* The system of arrangement was to some extent pre-determined by the fact that (1) the Committee, after much consideration had decided that the Santa Chiara Chapel must be placed in the apse at the end of the East Hall, and (2) that the Indian doorway was already built into the doorway adjoining pavilion No. 18. It therefore seemed natural to place the Eastern objects in the West Hall, and the Western objects in the East Hall.

In the West Hall, as the Indian doorway was already fixed near the west end, it was obvious that the Indian originals must be placed at this end of the Hall. Moreover, the very large Indian façade could only suitably be placed in the apse at the end. In each of the two Halls, a structural division in two halves is suggested by the buttresses which project on each side, near the centre. According to our arrangement, the Indian objects practically fill the western half, and the other Eastern objects occupy the eastern half of the West Hall.

The Oriental originals consist largely of woodwork. In the Indian examples, all the woodwork is placed on the north side, where it will be adjacent to the woodwork section. Those in stone and other materials, are arranged on the south side. Within these limits, it has been found possible to keep a strictly chronological system, beginning with the earliest at the west end. The large door of hammered copper from Amritzar is thus placed in a position where it is not far from the metal-work section.

The originals from Cairo, and other Eastern sites, which are in the Museum, are principally of woodwork, and it has therefore been found necessary to place these, not only on the north wall, but on the south wall as well.

The four fine ceilings from India and Cairo which require to be studied in fairly close detail, we propose to place in the floor space of this part of the Hall. We think that if these were raised on rods or columns to a height of about 7 to 8 feet, they would be best available for study. The upper surfaces could easily be boarded in and painted, so that they would not look unsightly.

In the East Hall, as has been stated, the determining feature has been the assignment of the "Santa Chiara" Chapel to the apse at the end. This chapel is of the 15th century, and the only objects of earlier date in the series are three well-heads which stand conveniently in front of it, and a mosaic with which the series starts on the south wall. From this point, the whole collection is arranged in chronological order, and it happens very fortunately that within this chronological order it has been possible to keep the objects of the several nationalities together. Thus, the four French examples of the 16th century fall together into their natural chronological position, and are succeeded near the end of the Hall by the English examples,

* The casts of large architectural objects, such as the Archer-Frieze from Susa, the Sanchi Tope Gateway, and the Porch of Chisti's Tomb, will take their place in one of the courts set aside for casts.

which are mostly of the 17th century and are grouped near the house front of Sir P. Pindar.

It has seemed to us that in the case of the Singing Gallery from Florence an exception should be made to the rule by which originals are not arranged so as apparently to form part of the Museum structure. We have, therefore, placed this gallery beneath the window which looks out from the long passage on the north side; this will give it, to a certain extent, a position similar to that for which it was intended, and enable its details to be studied more easily, while preserving the chronological sequence.

It will be seen that the wall space of both halls is fully occupied by this arrangement; but although there is little space left for other reliefs, there is ample room, either within the framework of the objects themselves, or beside them, for photographs, drawings and diagrams, which should be hung there in illustration of the buildings from which these originals are taken, and for similar or analogous examples. On the other hand, the floor space has been intentionally left unfilled in order to serve as room for expansion in case other examples may be acquired in the future.

Bois-le-Duc Screen.

The Committee, after exhaustive discussions covering a long period, and having considered various alternative proposals, recommend that this object be left in its present position, where it will be in close juxtaposition to the other original European architectural specimens in the East Hall.

Arrangement of the East Court.

It will probably be convenient to begin with the arrangement of the East Court (now tapestry) thus relieving the congestion in the large Architectural Court. Remembering the very unsatisfactory appearance of the court when used for classical statuary, and the great success of its present arrangement, the Committee suggest that the two great screens be left standing, and that the court be devoted to the smaller examples of sculpture and also to the casts of mosaics and perhaps some copies of decorative painting now in the North Court. This use of the court would facilitate the grouping of objects with a due regard to their relative scale.

The central avenue of the Architectural Court will afford space for objects of moderate size and might serve as a continuation of the Architectural index, containing casts of applied sculpture and carving, while the free sculpture of like size would be assigned to the East Court.

Architectural Index.

The object of this index should be the illustration by means of models, photographs, and drawings of the development of architecture. A number of models already exists in the Museum which would enable a beginning to be made with the formation of the index.

In the process of arranging such a series the directions in which the main collections both of originals and reproductions need extension would become apparent in a way that should be of great service in determining further purchases for the department of Architecture.

Illustrations of the early and archaic forms of architecture might be grouped immediately to the west of the main entrance, and along the passage would be shown the development of Oriental architecture in proximity to the large specimens in the West Hall. In the wide lobby, at the point where the passage opens to the West Court (old Science Library), now allocated to Oriental woodwork, the larger Oriental models of buildings would be placed; similarly the models of Italian buildings might be placed in the corresponding lobby which leads into the East Court (present Tapestry Court but hereafter to contain casts of European stone carving and applied sculpture). The whole of the passage to the right of the entrance would be devoted to European architecture.

At every point the labels should indicate where to look in the Museum for more ample illustration of the subject, and should, if necessary, refer the enquirer to other London Museums, or to buildings easily accessible.

To perfect such an index, to work out its arrangement in the most conveniently logical order, to make it complete and yet not redundant, attractive in appearance without descending to mere prettiness, would no doubt be a work of time and much thought and experiment. But since all the objects would be small, subsequent re-arrangement would not be costly, and could be carried out piecemeal, section by section, as material accumulated. For instance, photographs would, at the start, probably predominate —and photographs will always be invaluable—but in the mass their monotony is unattractive. Scale drawings are necessary for the student, but, again, are not attractive in the mass. The perfect architectural index should, if possible, include a large number of old engravings and good coloured drawings.

The Museum staff are already alive to the principle involved (as witness the drawings appended to the Montal window and to Sir P. Pindar's house). It should be followed throughout the department; for instance, the openings of the carved Italian doorways should be filled in with good illustrations of their position in the complete building and of other similar doorways.

Side by side with scale drawings of the Museum specimens should be placed outline drawings to the same scale of well-known and accessible buildings, for the purpose of impressing upon the student the value of scale.

4. Metalwork.

The Committee recommend for adoption the scheme set out in the following schedule:—

Location.	Nature of Objects.
West Court - -	Blacksmiths' work round the walls, with, possibly, "Goldsmiths' Jewellery," clocks and watches in the centre of the court.
Lobby outside northern entrance to West Court.	Ironbound chests, &c., so connecting the iron-work with the woodwork.
Galleries 36A to 39A - -	Lapidaries' jewellery, leading on to jade and crystal.
West Entrance Corridor -	Heavy foundry work, such as fire-backs, fire-dogs, bells and ordnance (Eastern and European).
Galleries 13 and 14 - -	Armourers' work, European cutlery, spoons, &c.
„ 15 to 19 - -	Silversmiths' work (British and Continental) arranged in order of craft-development, passing on to pewter, coppersmiths' and braziers' work. It is proposed that, in the rooms dealt with above, reproductions to supply gaps in the collection shall be placed as far as possible in the wall cases.
„ 1 to 7 - - -	Eastern metalwork, beginning with armourers' work and cutlery in gallery No. 1. This portion of the collection requires very careful selection, as a great many of the specimens are of purely ethnographical interest.

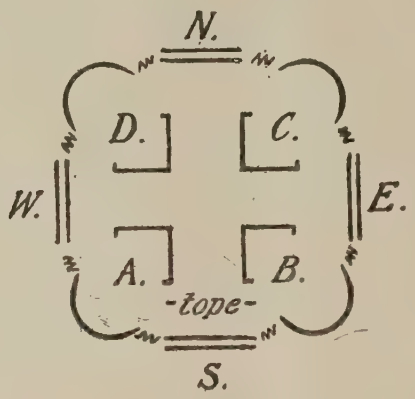
5. Woodwork.

It is proposed that some of the larger specimens of woodwork, being considerable portions of buildings, shall be placed in the Architectural Court on the north wall so that they will lead up to the woodwork on the floors of the several courts, and so to the old part of the South Corridor, which is to be exclusively woodwork. Following a suggestion made by the Director, it is proposed to place the great Spanish altar-piece (now in the Architectural Court, from which originals will be removed) at the north end of the East Central Court; other pieces of carved gilt and painted woodwork (Cassoni, &c.) could then be arranged on the floor, these being

comparable in style to the tapestries which it is proposed to place in this room and the adjoining courts, the Central and West Central. It would be convenient to group in these latter courts the sculpture in wood and high relief architectural carving, of which there is a fine collection.

The North-West Court should be an Oriental room leading from the Oriental architecture and should contain the rest of the Far Eastern woodwork, Indian and Chinese.

To take full advantage of this space, use should be made of angle screens, roughly speaking 10 feet high, in the positions sketched below.



In the contained Latin cross, loan collections might for the present be exhibited. About the South entrance should be placed certain large Indian casts, *e.g.*, the big tope from the top of the stairs in the present Indian gallery. There are a number of more or less architectural specimens which would group right and left of it at A and B, while woodwork from the Farthest East would follow on in the quarters C and D. Outside the north door would be metalwork, at the point where it is proposed to put some Chinese and other Eastern cannon, heavy bells, and such objects.

The South Corridor would contain much of the woodwork now there, as well as that from the short gallery by the Science School entrance hereafter to be given over to Circulation. At the east end of the South Corridor joinery would pass into cabinet-making, the "South Court" being the main furniture court, the furnished rooms being placed in the Cloisters as now.

The only grave logical defect in the scheme is that it seems not possible to connect the furniture closely with the Jones Collection, otherwise there is the basis of an intelligible and easily followed arrangement.

6. Textiles.

The list of the larger objects included under this section comprises the fine series of large tapestries and a few carpets which from their dimensions cannot be adequately exhibited in any of the ordinary galleries without disturbing the sense of proportion which the Committee consider should be preserved as far as possible throughout the arrangement.

The general scheme of the Committee provides for the allocation of large objects to the great halls and courts immediately adjoining the main entrance. These objects in the nature of things belong to various categories, but inasmuch as the courts form the starting point, as it were, from which the system of galleries radiates, there is nothing inconsistent in the arrangement by which the objects belonging to different sections should here converge and unite. Acting on this principle, the Committee propose that the larger textiles should be arranged on the walls of the West Central, Central, and East Central courts; and it is a satisfaction to find that this decision is in accord with Mr. Skinner's recommendations in this respect. Apart from the structural suitability of these courts for such objects, as offering large fields of unbroken wall space, their special form of roof ensures, as Mr. Skinner pointed out, an adequate protection from the sun.

The Committee have therefore prepared the scheme herewith submitted for the disposal of the larger textiles in these courts. The selection of the West Court for the Oriental specimens is determined by the fact that in the Committee's scheme for the arrangement of the Architecture, the Oriental

pieces are assigned to the West Hall, which adjoins this court; this court is moreover the nearest of the three to the galleries on the south sides (28 to 31) in which the Committee propose that the main series of Oriental carpets shall be arranged. For these courts, a selection has been made of the larger carpets and tapestries; taking those only which measure 150 square feet and upward, this gives a total of 22 carpets and 19 tapestries to be arranged in the three courts named.

Taking now the full lists of tapestries and carpets supplied, the Committee are of opinion that none of the tapestries can conveniently be withdrawn from exhibition; of the carpets, however, perhaps one fourth might be dispensed with from the public galleries, provided they could be stored in some place where they would be accessible in case of special demand.

This leaves 37 smaller tapestries and about 130 carpets still to be arranged.

Taking the carpets first, the Committee are of opinion that the most suitable position for these is the series of galleries 28 to 31. Having considered the various possible methods of grouping, they think that the development of technique in this instance can best be illustrated by means of models and diagrams, with cross-references to the specimens exhibited, and inasmuch as design and its development in respect of carpets is closely connected with locality, the proper arrangement is here the geographical.

The order would thus be as follows, commencing with the earliest Persian (which are the earliest in the collection) at the east end of gallery No. 31 and proceeding westward to the pavilion No. 28.

1. Persian.
2. Mogul.
3. Indian.
4. Turkish.
5. Asia Minor.
6. Caucasian.
7. Turkestan.
8. Yarkand.
9. Khotan.
10. Chinese.

Subject to this general scheme an attempt would naturally be made to preserve a chronological order as far as possible. The carpets should be hung on the walls facing the windows, and also on the type of V-shaped screens of which an example has been submitted to us. This system will leave a certain amount of the floor space free; this space we propose to devote as follows:—In gallery No. 31 the exhibition of models and diagrams already mentioned, illustrating the development of the craft; as this gallery is at the beginning of the series, and is moreover structurally semi-detached from those adjoining, it seems to be specially adapted for this purpose. The floor space of the remaining carpet galleries should be held in reserve, in case it may be found desirable to show here a series of the other textiles which from their purpose or technique might be considered as allied to the carpet industry; such (for example) as the hangings of Resht and Cashmir with appliqué or patchwork.

It may here be remarked that in formulating this general scheme of arrangement it is neither practicable nor desirable to lay down hard and fast lines. In a collection such as the textiles, comprising an immense number of objects, many of which combine in a single specimen illustration of more than one class of fabric or design, some overlapping is inevitable; and we think that considerable latitude (within the general principles laid down by the Committee) should be allowed to the Keeper in finally allocating the position of the objects exhibited.

Excluding for the present the space allocated by the Committee to lace,—viz., the continuous line formed by the passages across the South Court, the Architectural Court, and the East Hall, on the first floor,—there remains a T-shaped space formed by the long passage with galleries 25 to 27, for the reception of the smaller tapestries and the rest of the textile collection.

The smaller tapestries would conveniently be hung on the walls of No. 25; and on the floor space of this gallery and in the succeeding galleries Nos. 25 to 27 would come the damasks (in chronological order, beginning with the Byzantine, Sicilian, and early Italian), the velvets and the brocades. It may probably be found convenient, in order to avoid harshness of contrast, and to preserve the chronology, to arrange these in double or even in treble parallel lines. The linen damasks will come with the rest of the series to which they belong, but as most of these are unsuitable for permanent exhibition, provision should be made for their arrangement in special cases of a type to be carefully selected.

If this system is adopted, the Oriental specimens might be grouped at the end of each series, so that they would form a natural transition to the carpets.

The series would thus begin at the western end of the long gallery with the embroideries; these would be divided into (*a*) those on silk, and (*b*) those on wool; it will probably be found desirable to group together certain categories (such, for instance, as those of the Levant) which are best studied as a whole and which illustrate each other. Next follows needlework, which includes quilted fabrics and muslins; then printed, painted and dyed ("tie and dye") designs; and finally, the drawn, darned and other work of a coarser kind, which lead eventually on to lace.

The long gallery would probably not suffice to contain the entire series of objects belonging to these classes at present exhibited. The Committee think, however, that if a certain proportion of these were arranged in frame- or drawer-cases in this or some other gallery, a sufficiently representative series would remain for permanent exhibition in the space allotted.

The withdrawal from exhibition of a number of carpets brings us to the question as to the disposal of these. The ideal plan would be the provision (presumably in the basement within easy access of the Textile Offices) of a cold storage where the risk of destruction by moth would be obviated, and an adjoining room into which they could easily be taken as required for examination or study. The Committee are unaware whether in the lower ground floor such provision could without great expense be now made; failing this, it might be possible to assign a space for this purpose in one of the galleries 8 to 10 on the lower ground floor.

There remain the questions of (*a*) vestments, (*b*) furniture, and (*c*) other objects, such as boxes, book-covers, &c. which illustrate the application of textiles to objects used in daily life.

As regards (*a*), the Committee are of opinion that a selection of vestments is distinctly valuable as showing one of the purposes for which textiles were designed. Considering the importance of the Museum collection of vestments, it may be desirable to make special provision for their exhibition.

Where the specimens are less important as vestments than as illustrating one particular branch of the craft, these should be grouped under the series to which the craft belongs; but where a vestment illustrates in itself different crafts, and is of sufficient importance, it should take its place in the separate series.

As regards (*b*) and (*c*), where the object is of small size, and is not of greater importance to the category to which it belongs (furniture, woodwork, &c.), it might take its place among the textiles; in the other cases a cross-reference on a label, or by means of a photograph or drawing, would probably suffice.

The Committee understand that the Museum has been in the habit of receiving classes of students, numbering sometimes as many as 30 to 40, for courses of instruction in textiles under their own teachers lasting several days at a time; and that the Board are desirous of giving every facility to such classes. Hitherto it has been the practice to partition off a portion of the present Tapestry Court for their use. The Committee think it is highly important that in the new scheme of arrangement adequate provision should be made for a purpose which is so entirely in harmony with what the Committee conceive to be the true functions of the Museum; and they hope that in the ultimate arrangement of the spaces not yet allocated a room may be provided which will serve not only for this purpose but also for storing the smaller textiles removed from exhibition.

7. Ceramics.

The Ceramic collection to be housed in the new galleries of the Victoria and Albert Museum is so large, and in the main so excellent, that it is hoped it may be possible to arrange it in a fashion that will show the historical development of the craft, both on its technical and artistic sides, in a way that no other collection would admit. The arrangement, though roughly chronological, cannot be based on chronology alone, for it is much

more important to direct the attention of everybody, and especially of craftsmen and designers, to the influences of earlier work on later, of Oriental on European, of European on Oriental, and the interplay of these various forces particularly as exemplified in the work of Chinese, Japanese, and Persian potters.

It would be possible to commence at the eastern end of the South Eastern Gallery, next the Keeper's room; and in that gallery to arrange :—

1. The Egyptian pottery of the Dynasties, with its Turquoise, Green, Purple leadless glazes—and the fragments or specimens of early Assyrian, Syrian, and other derived wares.
2. Whatever specimens of Greek pottery and the allied wares of Greek Colonies, Roman and Etruscan wares the Museum possesses—the majority of which is not glazed in the ordinary sense.
3. The lead-glazed wares of Egypt in Ptolemaic times—the Byzantine fragments and all that belong to the same group.
4. This would lead on in due order to the early Syrian and Persian pottery, derived from the Egyptian leadless glazed wares; and secondly, to the Hispano-Moresque derived from the Egyptian lead-glazed wares.

   The foregoing suggestions refer only to the early potteries of these countries before, roughly, the 13th century.
5. Next would follow the collection of Persian, Syrian, and Turkish wares later than the 13th century, and illustrating the decorative faience made with leadless glaze.
6. Then would come the later Hispano-Moresque and similar wares, illustrating the firm establishment in Europe of tin-enamelled pottery.
7. The enamelled and lustred wares of Italy (Majolica).

   It may be mentioned here, that in this scheme it would be necessary to arrange at intervals, what may be called reference, or index, cases—labelled with full descriptive labels—to demonstrate the technical and artistic influences at work in the different countries.

   To give examples :—

   The influence of the art and technique of Syrian, Egyptian, and Persian pottery on the early Hispano-Moresque, and the influence of both these on the early Italian Majolica.
8. Then would follow, in natural order, the tin-enamelled wares of France, Germany, Holland, and England; until the tin-enamelled wares were superseded by English earthenware.

To reach English earthenware, it would be necessary to make a fresh start :—

The lead-glazed peasant pottery of Mediæval Europe.
The slip-decorated European wares of the 15th to 17th century.
The stonewares of Germany, the Low Countries, France and England.
The English Salt Glaze.
The English Cream Colour, &c., and its derivatives in Continental countries.

Porcelain.

The porcelain should be kept apart from earthenware and stoneware—with suitable index or reference cases where necessary.

The series would commence, of course, with Chinese Porcelain, Japanese porcelain, and then the various European porcelains (*Note.*—The collections are poor in all European porcelains except English).

Reference cases would be very necessary in this group to show, for instance, the influence of Chinese blue and white porcelain on the porcelain of Japan and the earthenware of Persia, and the influence of all these in turn on the early European porcelains. There is also the very important question of the tremendous influence of the Chinese and Japanese polychrome wares of the 18th century on European porcelains.

Tiles.

The panels of glazed tiles of various countries and periods should be arranged, as far as possible, on the walls of the galleries where the pottery of the same countries and periods are shown.

Terracottas and Unglazed Wares.

It might be advisable to treat these as one group, to be arranged historically in a separate gallery.

Fragments.

The Museum possesses many series of valuable fragments recovered by excavations on various sites. These should be arranged in drawers, beneath the cases, in the sections to which they belong. If the drawers are covered with glass they might be left unlocked so that any student could see them.

Arrangement of the Wall Cases.

The wall cases should not be too deep, and they should be fitted with glass shelves, and with electric lights immediately above if possible. A light-coloured background of pale drab material is the most suitable background for showing pottery against.

Engravings, Photographs, &c.

In some departments where the Museum collections are at present poor—say, for instance, European porcelains of the 18th century—it will be necessary to use large scale photographs or engravings or drawings to make the story intelligible.

8. Glass Vessels.

The space allotted to this section is the East Central Gallery, and the position proposed for the cases is shown in the appended plan.

The general idea of the arrangement of the "floor" cases is:—

Row I.—To illustrate ductility, which would include—
- (*a*) Form due to blowing and hand tools.
- (*b*) Form due to moulding with or without blowing.
- (*c*) Surface moulding.
- (*d*) Applied lines or threads.
- (*e*) Applied seals or "prunts."
- (*f*) Embedded sections of composite rods.
- (*g*) Embedded threads.
- (*h*) Embedded air bubbles.
- (*i*) Embedded metallic foil.

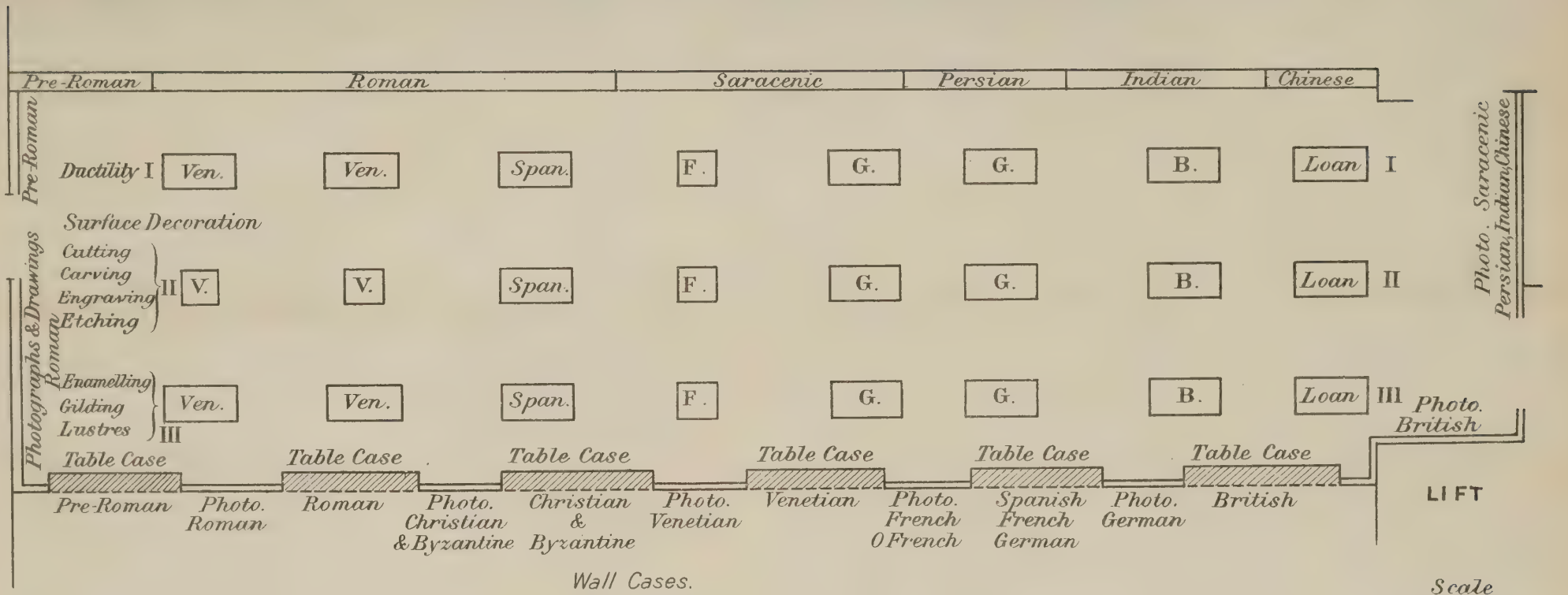
Row II.—To illustrate surface decoration, carving, cutting, engraving, etching.

Row III.—To illustrate surface decoration, enamelling, gilding, lustre.

In addition to this arrangement according to technique, the objects are also classified in main divisions of countries or schools.

It is considered best to start the sequence from the west rather than from the east, and it may be more convenient to visitors to place the cases parallel with the windows rather than at right angles to them. The objection to this arrangement for opaque objects does not apply to glass vessels. It is not the opinion of the Committee that glass objects suffer from being shown in wall cases, provided the cases are shallow and the background is white.

There should be desk cases in the windows for fragments and for small objects requiring very close examination, *e.g.*, mosaic fragments, millefiori, &c.



PLAN FOR ARRANGEMENT OF GLASS GALLERY.

Wall Cases.
Floor Cases.
Desk Cases in Windows for Fragments.
Photographs & Drawings in Frames at ends of Room & between Windows.

Scale
2½ 5 10 ft

Frames for photographs should be fixed between the windows and at the end of the room, as indicated in the plan.

The following abbreviations are used in the plan :—

B. = British.
F. = French.
G. = German (N.B. "German" includes German, Belgian, and Dutch).
V. or Ven. = Venetian.
Span. = Spanish.

9. Pictures.

In accordance with the views expressed by the Committee (pages 12–15) in regard to the future treatment of the collection of pictures, they recommend that pending the settlement of this question, the water-colour paintings should be re-arranged and that only carefully selected examples be placed on exhibition, the remainder of the pictures being placed in presses available for consultation by students. The room at present used as the Art Work Room could possibly be used for this purpose when its present occupants have been transferred to new premises. If this recommendation be carried out it is expected that great economy of space will be effected in the present picture galleries and that with the addition of the galleries to the east of the quadrangle, hitherto occupied by the Dyce and Forster Collection, ample space will be available for all of the picture collections, including the "Constable Collection" when removed from its present position. In this connection it may be well to point out that, in the opinion of many competent authorities, the life of a water-colour exposed to the light is limited, and no matter how carefully it may be placed steady permanent deterioration is inevitable; it might be well, therefore, if, in re-arranging the collection the possibility were considered of introducing a system under which temporary groups of water-colours would remain on view for a year or two and then be replaced by others.

10. The Library.

The Library attached to the Museum consists of three sections :—for books, for photographs, and for prints and drawings, respectively. The Committee carefully investigated the history and development of all these three sections. The Keeper in charge of the Library is responsible also for the supervision of the two sections of photographs and prints and drawings, each of which is in charge of an assistant keeper.

As the Committee have given considerable attention to each of these sections it will be convenient to deal with them separately and to explain in respect of each the conclusions to which the Committee have arrived.

(*a*) *Books.*

The Keeper in charge of the Library pointed out the need for increased accommodation. The shelving at present available is almost entirely occupied, and very little additional storage can be found.

This circumstance induced the Committee at once to consider whether the space now occupied by the Library afforded a sufficient scope for development, and whether the position of the Library itself was that best adapted for its purpose.

To take the second point first, the Committee regard it as a serious disadvantage that, placed where it is, the Library will block, when the new Museum is open, the access between the eastern and western portion of the Museum, and persons going from the Textile Galleries and wishing to proceed to the Picture Galleries will have to make a détour through Galleries 40A–43A and the north corridor. The disadvantage of this appeared to the Committee so serious that they endeavoured to find other space which could be suitably substituted for that at present occupied by

the Library. The only possible alternative, however, appeared to be the utilisation of the great North-West Court for this purpose. It is, however, very doubtful if this would be a satisfactory plan. The apses surrounding the court are not well adapted for book-shelving, and the area available for the storage of books would thus be considerably diminished. Indeed, in the opinion of the Keeper in charge of the Library, there would not be room in this court for the storage of all the books of the Library, so that considerable additional space would be required which might necessitate the reservation of the West Court for the purpose. If two such large and important courts situated in the centre of the Museum were reserved for the Library it would invest that department with an importance which, in the opinion of the Committee, is undesirable. Such a plan would have the further disadvantage of very gravely diminishing the space already available for the arrangement of the other departments. If the North-West Court only were reserved and bookcases built at right angles to the wall in the Central portion of the Court, so as to provide the necessary storage space, considerable inconvenience would be caused to the readers occupying the central portion of the Court by the noise caused by the continual fetching and arranging of books. Finally the execution of such a plan would involve considerable expense and probably further delay. The Committee have for this reason felt unable to recommend any alternative but to leave the Library in its present condition, and they have, therefore proceeded to consider in what way more satisfactory arrangements can be made for affording it more space for development. Of the three central rooms to the south of the quadrangle at present marked as "Library" on the plan, one is at present occupied as storage for the section of prints and drawings. A recommendation is being made that this section should be housed elsewhere, and the whole of this room should therefore be given up to the Library. A great deal of space could further be obtained by the introduction of a more modern type of bookcase, and by a systematic re-arrangement of the Library. The storage space in the galleries of the East and West Court could easily be doubled. Additional storage space could further, if required, be provided in such of the area to the west of the quadrangle on the second floor as is not otherwise occupied. In view of the transfer as already indicated of the prints and drawings section, the rooms now occupied as offices for that section could also be utilised for Library purposes. In this way the Committee think that a sufficient space will be provided to meet the requirements of the Library for a considerable time to come, though they are of opinion that if the premises now occupied by the Royal College of Art could in the future be converted to the use of the Museum, the opportunity should be taken of considering whether the Library could be placed in these premises and thus be removed from what at best is a most unsatisfactory position.

With regard to the Dyce and Forster Library, the Committee consider it unfortunate that such attractive and well lighted galleries as those to the east of the quadrangle should be devoted solely to the purpose of storage. They, therefore, recommend (as already stated on page 24) that the books of the Dyce and Forster Library be transferred to the corresponding galleries above those which they at present occupy and that the pictures belonging to this collection be placed in the galleries now occupied by the books, which could then be thrown open to the public. It is probable that more space is here available than will be required for the proper exhibition of the Dyce and Forster pictures, so that this arrangement will have the further advantage of increasing the exhibition space for the picture collection as a whole. The books which are now stored where it is proposed in future to store the Dyce and Forster Library could be transferred to some of the additional space given to the main Library itself.

(*b*) *Book Production.*

Under this heading the Committee propose to deal with the formation of a new section of the Library for the purpose of drawing attention to the best examples of lettering, writing, illumination, types, type-ornaments, the arrangement of lettering on a page, the arrangement of the ornament or

picture on a page, pictures as decorating the page of a book, not as illustrating its subject, and book bindings. The necessity for providing space for such an exhibition has been felt for some time, and the Committee are strongly of opinion that it is urgently required. They therefore recommend—

(*a*) that gallery 24 be retained as exhibition space for this purpose ;

(*b*) that this gallery shall be regarded as part of the Library and be under the control, perhaps, of the Keeper in charge of the Library, inasmuch as most of the objects to be exhibited will be drawn from his department ;

(*c*) That since the work of this section is intimately connected with that of the department of Engraving, Illustration and Design, the arrangement of the exhibition, shall be carried out after consultation with the officer in charge of that department.

(*c*) *Photographs.*

The Committee are of opinion that when the Museum has been rearranged in the new premises and has been divided into departments, it will be necessary that the Keeper in charge of each department should be responsible for the selection of the photographs of objects concerning his department, and that all such photographs should be kept in the department concerned.

If this view is accepted the Committee do not think that it will be necessary for a separate section of the Library to continue to exist for the purpose of the collection and classification of photographs. They would, therefore, suggest that the purchase of photographs be made through the Library on the requisition of the several Keepers, so that the officer in charge of the Library may have an opportunity of acquiring duplicates of such photographs as in his opinion are required for library use. The following are the recommendations of the Committee in regard to this conclusion :—

(*a*) That the purchase of photographs should continue to be carried out through the Library, but that the photographs to be purchased should be determined by the requirements of the different departments and communicated to the Keeper in charge of the Library by the Keepers in charge of the several departments.

(*b*) That photographs should be purchased for the use of the departments requisitioning them and should be preserved in those departments, but that it should be in the discretion of the Keeper in charge of the Library to purchase duplicate copies for the Library of such photographs as would be useful to readers.

(*c*) That photographs of pictures should be preserved in the Library rather than in the department for pictures (if such be formed), but that the selection for purchase of photographs of pictures be based on their value as illustrations of design and decoration.

(*d*) That wherever possible a dark room and other facilities for photography should be provided in connection with each set of Keepers' offices.

(*d*) *Departmental Libraries.*

In view of the proposed separation of the Keepers' offices from each other, and of the distance at which they will, in some cases, be from the Central Library, the Committee further recommend :—

(*a*) That departmental libraries shall be formed, primarily for the use of departmental officers.

(*b*) That the public shall be allowed the use of these libraries at the discretion of the Keepers in charge, and in so far as it does not inconvenience the work of the department.

(*c*) That the funds set apart for the formation and maintenance of these libraries be expended by the Keeper in charge of the Central Library on the requisition of the Keepers in charge of departments.

(*d*) That each of these libraries should aim at having a complete list of the books, photographs, models, drawings, and prints existing in the Central Library or elsewhere, which deal with the work of the department concerned.

(*e*) That these libraries should be supplementary in scope to the Central Library, and that their maintenance should not involve the purchase of rare and costly books.

11. Engraving, Illustration, and Design.

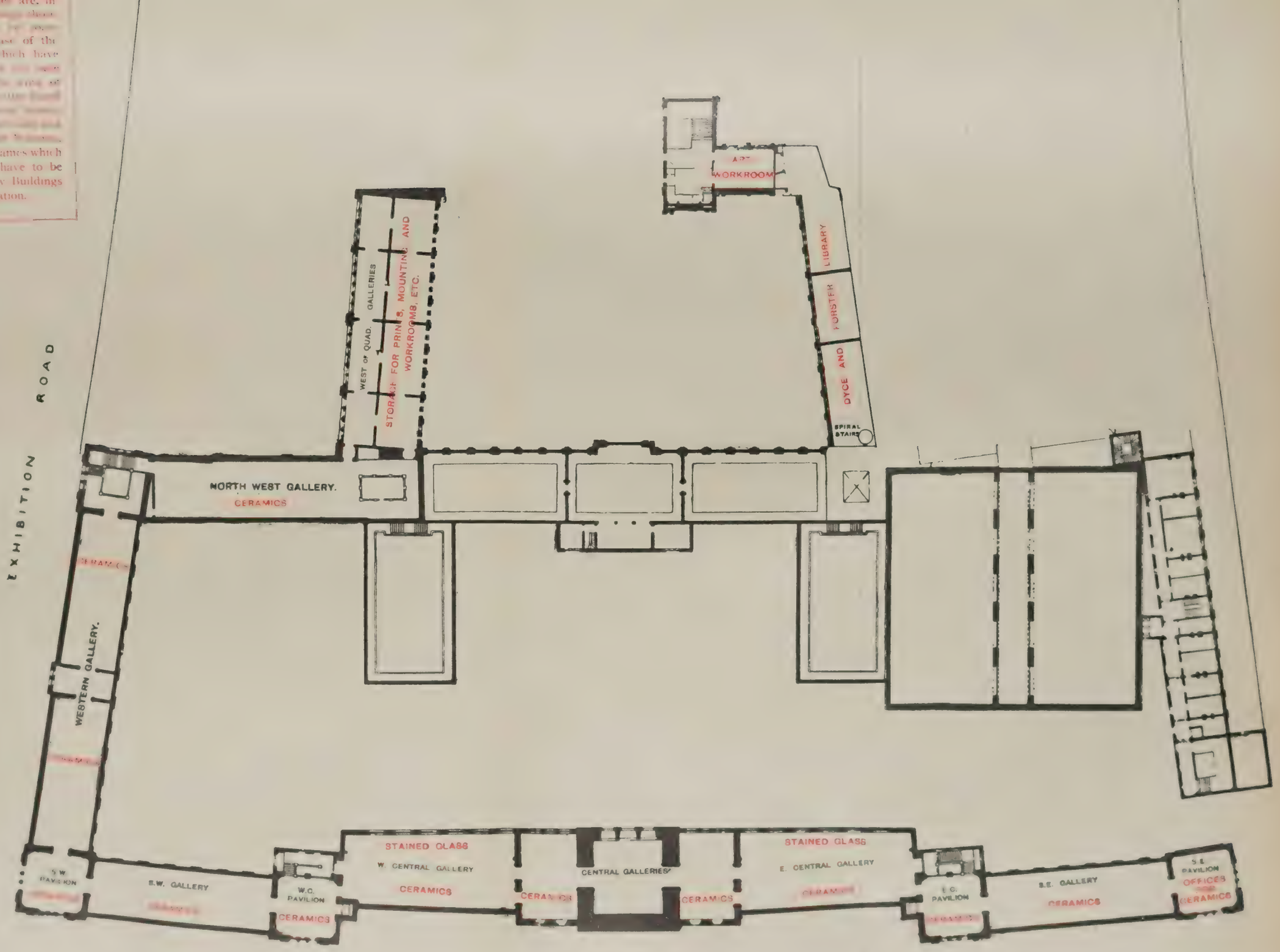
It is proposed that this department, with its offices, shall be located in rooms 40 to 43 and 40A to 43A on the first floor. Rooms 40, 41, and 43 would thus be available as offices for the department, with room 42 as a reading room for the public. Rooms 40A to 43A would be used as exhibition space. A certain number of the objects at present falling under this heading, such, for example, as measured drawings of architecture, will naturally be transferred to the departments which they concern; there will still remain a very large collection, for the housing of which the rooms immediately above those just mentioned will be convenient, viz., those on the second floor in the space west of the Quadrangle. The Committee understand that it has been proposed to construct a large press for this purpose in Gallery 24, and they recommend that in place of it a series of presses be placed in the storage rooms just named. One of these rooms should further be arranged as a workshop for mounting and other work in connection with this department.

CONCLUSION.

In concluding their report, the Committee desire to express their thanks to the Board of Education for the facilities which have been afforded them throughout their deliberations; also to the officers connected with the Museum for the information which has been placed at their disposal; and particularly to their secretary, Mr. Arthur Richmond, whose unremitting labour and skill have greatly lightened their task. They also wish to express their regret at the loss of the valuable services of Sir Charles Dilke, who was appointed by the Board of Education to be Chairman of the Committee, but who found it necessary to resign in the course of the Committee's investigations owing to pressure of other duties. And further the Committee desire to thank Sir Aston Webb for the courtesy with which he has always been ready to supply them with information in regard to the New Buildings; Mr. William Burton for the valuable help which he has afforded in the preparation of the scheme for the arrangement of the Ceramic Collection; and Mr. Reginald Blomfield for the assistance which the Committee have derived from his suggestions in regard to the proposed Architectural Index.

We have the honour to be, Sir,
Your obedient Servants,
Cecil H. Smith (Chairman).
W. A. S. Benson.
Lewis Day.
H. Powell.
J. C. Wedgwood.

Arthur Richmond, Secretary,
July 29th, 1908.


EXHIBITION ROAD
WEST OF QUAD. GALLERIES
STORAGE FOR PRINTS, MOUNTING AND WORKROOMS, ETC.
ART WORKROOM
LIBRARY
FORSTER
DYCE AND
SPIRAL STAIRS
NORTH WEST GALLERY.
CERAMICS
WESTERN GALLERY.
CERAMICS
S.W. PAVILION
S.W. GALLERY
CERAMICS
W.C. PAVILION
CERAMICS
STAINED GLASS
W. CENTRAL GALLERY
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STAINED GLASS
E. CENTRAL GALLERY
CERAMICS
E.C. PAVILION
S.E. GALLERY
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Scale of Feet.

VICTORIA AND ALBERT MUSEUM.

FIRST FLOOR PLAN.

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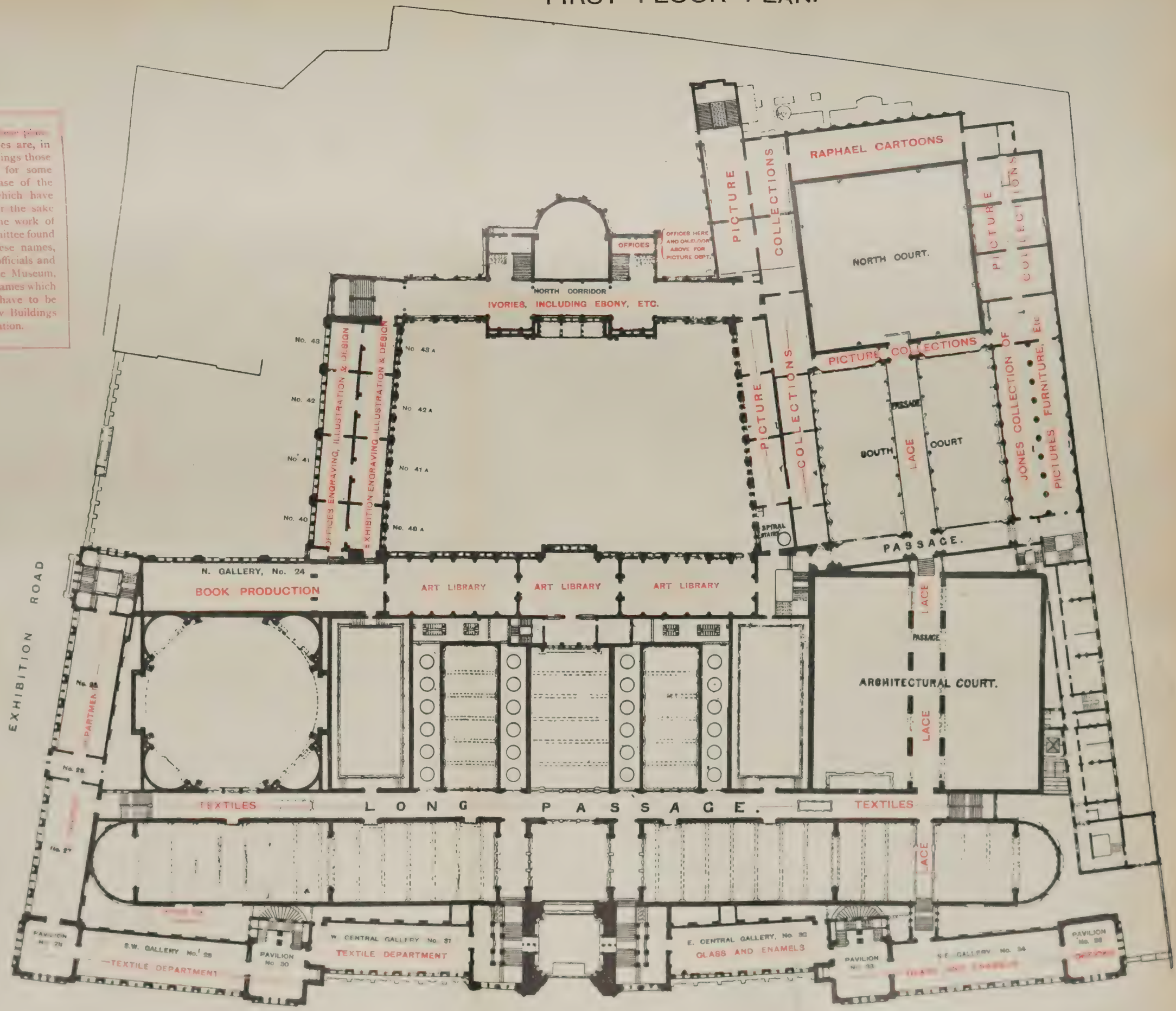

VICTORIA AND ALBERT MUSEUM.

GROUND PLAN.

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CIRCULATION COLLECTIONS

ENTRANCE

CIRCULATION COLLECTIONS

CIRCULATION COLLECTIONS

CIRCULATION COLLECTIONS

TEMPORARY NORTH COURT EXHIBITIONS

OFFICES

NORTH CORRIDOR.

No. 39

No. 39 A

No. 38

No. 38 A

No. 37

No. 37A

No. 36

No. 36 A

OFFICES FOR WOOD-WORK

LAPIDARIES JEWELLERY

QUADRANGLE.

WOOD-WORK

SOUTH COURT.

WOOD WORK

EXHIBITION ROAD

N.W. PAVILION

METAL WORK

SOUTH CORRIDOR

WOOD WORK

N.W. COURT

ROUND WALLS FAR EASTERN

WOOD-WORK, IN CENTRE

LOAN COLLECTIONS

WEST COURT

BLACKSMITHS WORK ROUND WALLS

JEWELLERY IN CENTRE

TAPESTRIES

WEST CENTRAL COURT

WOOD-WORK

TAPESTRIES

CENTRAL COURT

WOOD-WORK

TAPESTRIES

EAST CENTRAL COURT

WOOD-WORK

TAPESTRIES

EAST COURT

CASTS

ARCHITECTURAL COURT

CASTS

CASTS

STONE AND MARBLE DEPARTMENT

ARCHITECTURAL

L O N G P A S S A G E

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CENTRAL HALL

EAST HALL

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METAL-WORK

PAVILION No. 18

W. CENTRAL GALLERY No. 19

METAL-WORK

VESTIBULE

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STONE AND MARBLE DEPT

PAVILION No. 21

S.E. GALLERY, No. 22

AND MARBLE DEPARTMENT

CROMWELL

VICTORIA AND ALBERT MUSEUM.

LOWER GROUND FLOOR PLAN.

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EXHIBITION ROAD.

No. 1 GALLERY

No. 2 WEST

No. 3

SW GALLERY No. 5

PAVILION

W CENTRAL GALLERY, No. 7
METAL-WORK

E. CENTRAL GALLERY, No. 8
STONE AND MARBLE

PAVILION No. 9

SE GALLERY No. 10
STONE AND MARBLE

PAVILION No. 11
OFFICES

STORAGE

STORAGE

CROMWELL

EDUCATION (SCOTLAND).

REPORT FOR THE YEAR 1907

BY

THE DIRECTOR,

JAMES J. DOBBIE, Esq., D.Sc., F.R.S.,

ON

THE ROYAL SCOTTISH MUSEUM, EDINBURGH.

Presented to both Houses of Parliament by Command of His Majesty.

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1908.

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REPORT *for the year* 1907 *by* JAMES J. DOBBIE, Esq., D.Sc., F.R.S.
on THE ROYAL SCOTTISH MUSEUM.

31st December, 1907.

MY LORDS,

I have the honour to submit my Report on the Royal Scottish Museum for the year 1907.

The past year has been marked by a large increase in the attendance of visitors, the number exceeding that of 1906 by ninety-two thousand. This increase is no doubt in some measure accounted for by the alteration of the hour of closing, from 4 p.m. to 5 p.m., which came into force on the 15th of July. But after every allowance has been made for any special causes which may have influenced the attendance during the past year, so large an addition to the number of visitors can only be regarded as a gratifying evidence of the growing interest in the Museum on the part of the general public.

That the value of the Museum Collections for the purposes of systematic study is being more and more widely recognised is shown by the fact that the number of students who visited the Museum accompanied by their teachers in the course of the year was nearly three times as great as in the previous year. These visits were arranged for and conducted under the regulations providing for the holding of demonstrations, and it is worthy of note that many of the students travelled from considerable distances for the express purpose of studying the models illustrating coal mining which have recently been added to the Mining Hall.

Another very satisfactory feature of the past year has been the unusually large number and the importance of the donations which have been received. The Natural History and Geological Departments have chiefly benefited in this way. I should like to take this opportunity to emphasise the claim for an extension of similar generous treatment to all the Departments of the Museum. To the Art Collections in particular the assistance of the private benefactor would be specially helpful. It is impossible out of the slender grant allowed by the Treasury for the purchase of specimens to make those additions of rare and costly objects which it is the function of an institution such as this to conserve and exhibit for the education of the practical Art Student, and I earnestly desire to call attention at the present time to this need of the Museum in view of the approaching opening of the new School of Art. It is well known that for the success of such a school it is of the first importance that its pupils should have ready access to examples of original Works of Art of the highest quality. It is impossible to over-estimate the stimulating influence of the great collections in the Victoria and Albert Museum upon the

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pupils of the Royal School of Art at South Kensington, and those who are interested in the new School for Edinburgh could find no more efficacious way of assisting it than by contributing towards the acquisition of the specimens which are needed to give greater variety and fulness to the Art Collections of this Museum.

The increase in the attendance at the Museum and the large additions which have been made recently to the collections render more urgent than ever the need for an extension of the building—a matter with which I have dealt in former Reports—and it is much to be desired that some practical step in this direction should be taken in the course of the ensuing year. I may mention in this connection that the installation of the new heating and ventilating system which is now in progress will involve a considerable curtailment of our already too limited space.

Two changes in the staff of the Museum fall to be noticed. The post of Assistant in the Natural History Department, rendered vacant by the promotion of Mr. Percy H. Grimshaw to be Assistant Keeper, has been filled by the appointment of Mr. James Ritchie, M.A., B.Sc. On the death of Mr. J. G. Goodchild at the beginning of 1906 the arrangement under which an officer of H.M. Geological Survey was stationed permanently in the Museum in charge of the Survey Collections was brought to an end. The necessity was then urged upon the Treasury of making provision for an additional Museum officer to whose care the whole of the Geological Collections belonging to the Museum might be entrusted, and this proposal having been assented to, Mr. S. J. Shand, B.Sc., Ph.D., was appointed to the new post. This appointment marks an important advance in the organisation of the Museum, as, for the first time, it affords an opportunity of bringing together and co-ordinating the extensive and valuable Geological Collections which were formerly distributed throughout other Departments of the Museum.

In the course of the year several improvements which have added greatly to the comfort and convenience of the public have been effected in the Museum Buildings by H.M. Office of Works. Satisfactory progress is being made with the installation of the new system of heating and ventilating the building, and it is expected that the work will be completed in the course of the ensuing year. So far, the operations have been conducted without accident and have caused little inconvenience to the general public or interruption of the routine of the Museum business.

I desire once more to direct your Lordships' attention to the danger to which the Museum is exposed from the close proximity, along nearly the whole of its south side, of buildings containing highly combustible material, and I think it advisable, on this occasion, to indicate more precisely than I have yet done the nature of the danger to which I refer.

The buildings of the Museum form one side of a triangle, the other two sides of which are occupied by high tenements of dwelling houses. A large part of the space thus enclosed is covered with low, one-storey buildings, which reach from the

tenements almost to the walls of the Museum. These buildings are used partly as warehouses by a large firm of wine and spirit merchants and partly as a store connected with a painter's establishment which forms part of the ground floor of the neighbouring tenement. Adjoining the west wing of the Museum is a large building, originally a chapel, but reconstructed a few years ago to serve as a bonded warehouse. This building is four storeys high, and is filled on every floor with casks of whisky and other inflammable liquors. Its north wall, which is over against the south wall of the west wing of the Museum and nearly parallel with it, is pierced with numerous windows which are directly opposite to and, at one point, within eleven feet of the Museum windows. As a measure of precaution, these windows of the Museum have recently been fitted with iron shutters, which are closed at night; but it is obvious that this would prove an altogether insufficient protection in the event of fire breaking out in the bonded store. Within the last four years three large whisky stores have been burned down in Scotland—at Greenock, Dundee, and Aberdeen—the fires being accompanied by violent explosions, which caused widespread destruction to the adjoining property. From the nature of the case the combustion of large quantities of spirit stored in a confined space is almost certain to be attended by explosion. This constitutes the special danger arising from the contents and use of the buildings on the south side of the Museum, and it is impossible to provide adequately against it except by their removal.

A general Guide to the Collections of the Museum has been prepared by members of the Museum staff, and is now in the hands of the printer. I have to express my gratitude to Dr. Horne, F.R.S., and to the members of the staff of H.M. Geological Survey who have kindly assisted in the revision of the Guide to the Collections of the Survey in the Museum, a new edition of which has just been issued.

I submit, herewith, the Reports of the Keepers of the various Departments of the Museum.

In his Report on the Art and Ethnographical Department Mr. Vallance refers to the changes in the Great Hall, rendered necessary by the setting up in suitable positions of the casts from the Treasury of the Cnidians and the Pergamos Frieze recently acquired for the Museum. The effect of the new arrangement on the appearance of the hall is entirely satisfactory, and the alterations will facilitate the future grouping of other specimens according to styles and periods—always a difficult matter where large objects of various dimensions have to be dealt with in a limited space. The cast of the Treasury is a replica from the moulds made for the authorities of the Louvre from the original at Delphi, and is the only copy in this country. The archæological interest of this temple-like structure will be appreciated by all students of the history of art, and the beauty of its design and decoration must prove a valuable guide to those engaged in the work of the practical Art School.

Another important addition to the Art collections—a Jacobean oak-panelled room—is an interesting example of a style

previously represented in the Museum only by isolated pieces of furniture.

A large number of specimens have been received from the Committee of the Egypt Exploration Fund and from the British School of Archæology in Egypt through its Hon. Director, Professor Flinders Petrie. The donations from the latter include a remarkable and beautiful example of a 12th Dynasty mummy case and a complete series of "soul houses," models in terra cotta of the various types of dwellings in use amongst the common people of ancient Egypt. They were obtained last year by Professor Petrie from tombs at Rifeh.

Amongst other specimens presented by the British School of Archæology in Egypt, special mention should be made of two very handsome alabaster vases, which have helped to complete an interesting case of pre-dynastic vases and bowls of alabaster, diorite, and granite. As now set out, these cannot fail to impress the visitor with the skill and sense of form possessed by the workers of that very remote period.

Mr. Edwin Ward, one of the Museum officers, who was a member of Professor Petrie's party when the objects just referred to were excavated, has been sent out again this season to Egypt, and will take part in the important work in which the British School are engaged at Memphis.

Amongst the Egyptian antiquities acquired by purchase in the course of the year is a collection of clay cones bearing inscriptions of which Dr. Colin Campbell has been good enough to furnish us with translations.

A few months ago an opportunity occurred of acquiring a collection of eighty Babylonian inscribed tablets of a kind of which the Museum possessed only a few examples. Professor Sayce, to whom we had previously been indebted for much valuable assistance in connection with our Egyptian collection, kindly undertook to examine the tablets, and, in accordance with his advice, they were purchased for the Museum. Professor Sayce has since placed us under a further obligation by providing translations of the cuneiform inscriptions and with material for the labelling of the specimens.

Amongst the donors to this Department, special mention should be made of Mr. Thos. McKie, LL.D., Advocate, who early in the year presented to the Museum a large collection of art objects, including faience, enamels, ivory, and metal work collected by his brother, the late Mr. Wm. McKie, Moat House, Dumfries.

In the Ethnographical Section collections from Central Africa, Siam, Korea, Tibet, and Peru have been acquired during the year. These collections were all formed on the spot by responsible persons resident in these countries, or, as in the case of Dr. Moloney's Central African Collection, by travellers attached to expeditions organised in the interests of scientific research.

In the Natural History Department, Mr. Eagle Clarke reports that an extensive re-arrangement of the Hall devoted to British Animals, a work which has been in progress for several months, is now well advanced towards completion. This re-arrangement

has been undertaken with the twofold object of filling up the gaps which existed in the collections and of grouping and mounting the specimens in a more artistic and attractive manner.

Preparations have been added to the Type Collection showing the general characters of Mammals, Birds, Reptiles, Amphibians, and Fishes, and it is hoped that these will prove specially useful to students. The scientific labels in this Department have been supplemented by labels couched, as far as possible, in simple, non-technical language, describing the characters of the principal groups of the Animal Kingdom.

The additions made to the Natural History Collections in the course of the year have been upon a scale unequalled in any recent year, and include no fewer than 7,052 donations, many of them of very considerable value. The Museum is indebted to the Trustees of the British Museum for specimens of the Mammals and Birds brought home by the National Antarctic Expedition, and also for a large number of Mammals and Marine Invertebrates selected from their duplicate collections. The Hon. Walter Rothschild has again been a munificent patron of the Museum, his gifts for the year including a beautiful series of Exotic Fishes painted in their natural colours. A complete skeleton and plates of the baleen of the rare Atlantic Right Whale have been received from Mr. Carl F. Herlofson; a skeleton of the Bottle-Nose Whale from Mr. Theodore Salvesen, and a Scottish example of the white-beaked Dolphin from Mr. Wm. Lumley. Large collections of Birds have been presented by Mr. N. B. Kinnear and Mr. J. J. Dalgleish; of Fishes by Dr. R. H. Traquair, F.R.S., and by the Fisheries Branch of the Irish Department of Agriculture, to whom, as well as to the North Sea International Committee of the Scottish Fishery Board, the Museum is indebted for numerous additions to the collections of Marine Invertebrates. Collections of Insects have been given by Mr. Claude Morley, Professor J. J. F. X. King, the Rev. J. Waterson, Miss Horne, Mr. H. E. Scott, and Mr. Chas. Stuart.

The work involved in identifying, labelling, and registering so many new specimens has put a severe strain upon the staff of the Natural History Department, and has made doubly acceptable the valuable assistance rendered by the Hon. Gladys Graham Murray and Mr. Norman B. Kinnear, which I desire most gratefully to acknowledge.

Dr. Galt reports that in the Technological Department attention has been concentrated chiefly on the development of the Mining, Metallurgical, and Engineering Sections. The most important additions to the Mining Collections are two models showing the underground arrangements employed in the "long wall" and "stoop and room" methods of winning coal. These models belong to a series designed to illustrate fully the subject of coal mining, especially as practised in Scotland.

In the section devoted to the Metallurgy of Iron and Steel, the additions for the year include models of a new type of furnace used in the manufacture of steel by the cementation process, and of a modern blast furnace, both made in the workshops

of the Museum. The drawings used in the construction of the latter model were kindly supplied by the Glengarnock Iron and Steel Company, to whom I have to express my thanks not only for this courtesy, but for much valuable assistance rendered while the model was under construction.

Several new working models, which can be set in motion by the visitor, have been installed in the Machinery Hall. One of these illustrates a method of driving a wire rope or cable, which is largely used for haulage purposes in mines, and another shows how, by means of the cotton "rope drive," power is distributed over a large textile factory. For the drawings used in making these models we are indebted to Messrs. D. and A. Home Morton, Glasgow, and to Messrs. Douglas Fraser and Sons, Arbroath. Special mention should also be made of the "economiser" presented to the Museum by Messrs. E. Green and Son, Limited, Wakefield.

Excellent progress has been made with the Botany Type Collection, which has now practically reached the dimensions necessary to meet the requirements for which it was designed.

Dr. Shand since his appointment has been principally occupied with the arrangement of the Gubbin Collection of Fossils. This collection, which consists of about 20,000 specimens, obtained chiefly from English localities, was bequeathed to the Museum by the late Dr. Gubbin, of Bristol, who died at the beginning of this year. As the fossils are from nearly every geological formation represented in England, they form the nucleus of a comprehensive stratigraphical collection, and thus supply a want which has been long felt in the Geological Department of the Museum.

Amongst other important additions to the Geological Department in the course of the year Dr. Shand calls attention to some fine slabs of sandstone from Dura Den, Fifeshire, containing specimens of Holoptychius Flemingii and Glyptopomus Kinnairdi, presented by Mr. C. B. Meldrum, of Dura and Balmungo, and to a series of hand specimens and microscopic sections illustrative of the igneous rocks of the Christiania district in Norway, acquired by purchase. These specimens were collected and described by Professor W. C. Brögger, of Christiania, and it is believed that they will prove of great value to students of petrology.

Mr. Muston reports that the additions to the Library, by donation and purchase, number 466 volumes, besides pamphlets. H.S.H. Albert, Prince of Monaco, presented the Library with a complete set of the Bulletins issued from the Oceanographical Museum, Monaco. Among other donors were the Governments of Germany, France, Belgium, Bengal, Bombay, Madras, the United Provinces of India, and Canada; and the authorities of the India Office, British Museum, Board of Education, Scotch Education Department, and Meterological Committee; as well as a number of Societies and Museums in India, Australia, South Africa, Canada, the United States, Mexico, and the United Kingdom. The publications of H.M. Patent Office, the Specifications of American Patents, and a number of the new Ordnance Survey

Maps of Scotland on the 6-inch scale, and of England and Ireland on the 1-inch scale, together with some Geological Maps of Scotland on the 1-inch scale, have been received. The number of tickets issued, giving free admission to the Library, was 237. The Library was largely used throughout the year by students in various branches of Art and Science.

I have the honour to be,

our Lordships' obedient servant,

JAMES J. DOBBIE.

To the Right Honourable the Lords of the Committee of Council on Education in Scotland.

APPENDIX.

TABLE OF ATTENDANCE OF VISITORS, 1907.

Month.	Sundays.	Weekdays.	Evenings.	Total.
January - - - -	9,481	27,256	14,392	51,129
February - - -	9,484	15,523	11,871	36,878
March - - - -	9,407	14,473	13,688	37,568
April - - - -	8,060	19,287	10,880	38,227
May - - - -	6,200	18,568	10,183	34,951
June - - - -	8,532	23,944	13,283	45,759
July - - - -	6,067	39,111	12,327	57,505
August - - - -	8,425	39,624	12,024	60,073
September - - -	9,892	25,489	10,726	46,107
October - - - -	9,894	23,960	11,634	45,488
November - - -	10,986	22,746	13,954	47,686
December - - -	11,013	22,533	8,659	42,205
Total - - -	107,441	292,514	143,621	543,576

Average annual attendance for last five years - 466,534

Average daily attendance for 1907 { Sundays - 2,066 / Weekdays - 1,398

REPORT OF THE KEEPER OF THE ART AND ETHNOGRAPHICAL DEPARTMENT.

The original marbles of the building known as the Treasury of the Cnidians, excavated in remarkably perfect condition at Delphi by the French school working there, were moulded a few years ago, and a cast now occupies a prominent position in the Louvre, Paris. A replica from the Louvre moulds has been obtained for this museum, and is now set up in the Great Hall. To make room for it the Tabernacle from Léau, Belgium, which faced and somewhat cramped the entrance, has been taken down and moved to the east end of the hall. This change brings the Tabernacle into proper relation to the objects with which it is classified, and from its proximity to both galleries, the details of the sculpture and ornament can be conveniently examined over its whole height of more than 50 ft. The substitution in its place of the Treasury prepares the way for a concentration and a more orderly arrangement of the classical collection of sculpture, and meantime the change has produced a marked improvement in the appearance of the hall. The moderate size of the Treasury—the façade measures 20 ft. by 24½ ft.—has made it possible to bring what is virtually a complete Greek architectural composition into the Museum, and so within easy access of Scottish students of architecture. The date of the building is sixth century B.C. The figure sculpture, though archaic, is of great interest to archæologists, and the beauty and fine disposition of the ornament, producing at once an impressive and charming effect, make this little building an instructive guide to designers in many forms of art work.

A communication from the Director of the Königlichen Museum, Berlin, was received at the end of last year to the effect that it was proposed to mould from the original marbles, the entire portion of the Pergamos Frieze, known as the Hecate Group, only a part of which had previously been reproduced, and inquiring if a cast of it was desired for this Museum. This cast has now been set up against the south wall of the Great Hall. Including the base and dentilled cornice it measures 17 ft. by 10 ft. 4 in., and is composed of six figures with animals all in high relief, and on a scale larger than life. This great frieze, representing the Battle of the Gods and Giants, is of the second century B.C., a work of the very end of the Greek period. It thus affords an interesting contrast with the sculptures of the same subject on the Treasury of the Cnidians, done in the sixth century B.C., when the art was still in its early archaic stage.

In the section of Furniture and Woodwork an important addition of the complete panelling, etc., of a Jacobean room of the seventeenth century will also be of interest to architectural students and designers. The information kindly transmitted by the authorities at the Victoria and Albert Museum, that the house at one time occupied by Lord Jeffreys, at Lower Edmonton, near London, was about to be altered to suit modern requirements, and that the fine oak panelling was to be removed, opened negotiations which led to the acquisition for the Museum of the fittings of a complete room—its wall-panelling with pilasters and frieze, a very fine chimney-piece and over-mantel, and bay windows, all in condition to allow of a perfect reconstruction of the original room, as has been done so successfully with similar rooms at the Victoria and Albert Museum. A complete specimen such as this not only gives a clearer idea of the style than can be gathered from illustrations in books, but it also adds a new value to isolated pieces of furniture and detached carvings of the period which naturally form part of a museum collection. In this connection may be mentioned the acquisition of a number of miscellaneous domestic articles from the Tudor times and later. They include caps, shoes, jugs, and other domestic articles, most of them found in London.

Sir Thomas Gibson-Carmichael, Bart., has added another gift to the many already received from him—a reliquary in silver-gilt, Spanish work of the fifteenth century—an interesting addition to the fine collection of

mediæval ecclesiastical metal work in the Museum. Examples of more recent art work in faience, enamels, ivory, and metal work, have been presented by Mr. Thomas McKie, LL.D., from the collection formed by his brother, the late Mr. William McKie, Moat House, Dumfries, and of the same class are several fine pieces of European and Chinese porcelain, given by Mrs. Boswell, Trinity Road, Edinburgh, selected from those belonging to her son, the late Mr. Alexr. Boswell, Edinburgh; and Mrs. Kay, Drumpark, Dumfries, presented a specimen of Roman mosaic work acquired in Rome in 1869. A very finely decorated Egyptian coffin, given to the Edinburgh Academy by Sir Colin Scott Moncrieff, K.C.M.G., etc., a former pupil of the school, has, by the courtesy of the donor and of the directors of the school, been transferred to this Museum. It is now well shown in the Egyptian collection, and is a valuable addition to the series of decorated mummy cases.

The contributions sent directly from the explorations in Egypt cannot fail to interest both the public and the student. The relief sculptures received in former years from the committee of the Egypt Exploration Fund have been supplemented by additional examples from Deir el Bahari, the last that will be forthcoming from this prolific site, as excavations on it have now terminated. From the British School of Archæology in Egypt and from Professor Flinders Petrie several important contributions have been received. Among these should be specially mentioned the twelfth dynasty mummy case, which is really a notable example of sculpture in wood. The sculptured face of the deceased, though thickly overlaid with gold, and with eyes worked in enamel of the colours of life, maintains perfectly the effect of naturalness, and the heavy wig of a blackish green colour throws into forcible contrast the clean cut but unmistakably Egyptian features of a distinguished person of 4,500 years ago. A complete set of four canopic jars, taken from one grave, with finely carved heads of the genii of the dead, and inscribed for the "true royal friend Imhotep," and several very fine alabaster vases, are also from Professor Petrie. The vases just referred to have enabled us to complete a case of these remarkable objects, most of them from pre-dynastic times. To the archæologist the series of Soul Houses, as Professor Petrie has named them, will prove of special interest. They are models in terra-cotta of various types of the dwellings of the common people of Egypt executed more than 5,000 years ago, and a case has been filled with them, showing their various forms, from the desert tent to the porticoed house. The interest and value to the Museum of these objects from Egypt is considerably increased, not only by the authenticity which they bring with them direct from the excavations, but also by the fact that the Museum was represented on the spot by Mr. Ward, one of its officers, who took an important part in the work of excavating in Egypt all through the season. The specimens acquired during the year include three decorated mummy cases, work of the later period in Egypt, several stelae, both in stone and wood, sculptured heads in marble and limestone, and in the latter material a striking figure of Isis with outstretched wings. Of objects associated with the home life of the people are a number of examples of basket and mat weaving, brushmaking, etc., and, with several detached pieces of wood furniture, a complete chair or stool in excellent condition. A large collection of clay cones, supposed to represent loaves of bread, and all of them inscribed in hieroglyphics, was also acquired, and in this connection Dr. Colin Campbell kindly placed his knowledge of Egyptology at the disposal of the Museum, and provided a reading of these and of other inscriptions.

Of about the same date as many of these inscribed Egyptian remains are a number of Babylonian tablets from the neighbourhood of Ur of the Chaldees and Tello, acquired during the year. Professor Sayce not only kindly examined the 80 specimens before the purchase was completed, but has since devoted a considerable time to the reading of the cuneiform inscriptions, and providing material for the proper labelling of each specimen.

A fortunate opportunity occurred during the year of acquiring several

ethnographical collections directly from the collector's hand. The collection of objects from Central Africa made by Dr. Moloney while attached to the Stairs' expedition across Africa in 1890-91 (described in Dr. Moloney's book "With Captain Staïrs to Katanga") was offered early in the year, and a selection was made from it of the most important of the specimens, all of them of a kind now most difficult to acquire, and which were unrepresented in our cases. A member of the Medical Mission in Korea, with a long and intimate acquaintance with the country, has supplied a number of objects illustrating the native life and customs, some of them of special interest as bearing upon the relations of Korea with Japan. Also from a resident in the country a number of specimens have come to fill out the Siamese collection, and the acquisition of the Le Mesurier collection, along with other specimens from Tibet, raises the Tibetan section to a level with the other collections representing the arts of Asia. Among other acquisitions are fine examples of ancient pottery brought from the neighbourhood of Truxillo, Peru, and several pieces of sculpture and carving, mostly in hard stone—minor antiquities illustrating the ancient religion and art of Mexico.

Loans to the Art and Ethnographical Department during 1907:—

Miss Blair, Pavilion, Melrose.—Oriental and English pottery and porcelain, weapons, stone carvings, etc.
H.M. Office of Works.—Model of the Register House, Edinburgh.
Sir Thomas D. Gibson-Carmichael, Bart.—Iron bracket shop sign and three rosettes.
Miss B. Peddie, Edinburgh.—Hand of an Egyptian mummy.

Loans withdrawn from the Art and Ethnographical Department in 1907:—

Two glass ampullae, lent by Sir Thomas D. Gibson-Carmichael, Bart.
Indian jewellery, lent by Lady Murray.
Vicuna wool shawl, lent by Mr. A. Steuart.

D. J. Vallance,
Keeper of the Art and Ethnographical Department.

Report of the Keeper of the Natural History Department.

During the year the time of the staff of the Natural History Department has been chiefly devoted to an entire re-arrangement of the Hall in which the British animals are displayed. New cases have been built for the exhibition of the Passerine Birds, the Birds' Eggs, the Mollusca, the Insects and other Invertebrates; and the re-arrangement of these groups, with a view to rendering them more artistic and attractive, has already in a great measure been carried out. Many of the Fishes in this hall have been carefully painted in their natural colours. The collection of marine Invertebrates has been rendered more complete by the addition of numerous new specimens. In the type collection for the use of students, preparations have been made showing the general characters of Mammals, Birds, Reptiles, Amphibians, and Fishes, and these, it is hoped, will form a useful introduction to the study of the groups named.

In order to render the collections more generally useful to the public, labels, couched in the simplest possible language, describing the principal characters of each group, have been prepared and placed in the various halls and galleries; while labels of a more technical nature have been supplied for the use of students.

The collection of Reptiles, Amphibians, and Fishes, preserved in spirit, has been brought together and systematically arranged in new cases. A commencement has been made of a general collection of disarticulated skeletons for the use of those interested in osteology. In the large Mammal hall the beautiful series of seals collected by the Scottish National Antarctic Expedition, and presented by Dr. W. S. Bruce, has

been completed, and now contains representatives of practically all the species which occur in South Polar seas.

During the year the Natural History Department has been materially assisted by the services of the Hon. Gladys Graham Murray and Mr. Norman B. Kinnear, both of whom have done much useful work in the arrangement of the extensive cabinet collection of Birds and Mammals; an obligation which it affords me much pleasure to gratefully acknowledge.

A very large number of specimens have been added to the collections in the course of the year, and of these it is gratifying to be able to state that no fewer than 7,052 have been by donation. The gifts include a fine series of skins of Mammals and Birds collected by the National Antarctic Expedition under Captain Scott, and presented by the Trustees of the British Museum. The department is also indebted to the British Museum for a large number of duplicate Mammals and Marine Invertebrates. A complete skeleton and a number of plates of Baleen of the rare Atlantic Right Whale have been presented by Mr. Carl F. Herlofson. The Hon. Walter Rothschild has given exotic Fishes, and a cast of a large example of the Angler Fish, all beautifully painted in their natural colours; also a set of large photographs, taken from life, of the practically extinct Californian Elephant-Seal. Casts of two skulls of the Okapi have been presented by Sir E. Ray Lankester, K.C.B.; a skin and skeleton of a Celtic Pony, by Professor J. Cossar Ewart; and a complete skeleton of the Bottle-nose Whale (*Hyperoodon rostratus*) by Mr. Theodore Salvesen, who has also contributed a complete set of teeth of the Sperm Whale and a foetal Balænoptera. The Society of Antiquaries of Scotland have given a number of bones of Horses from the Roman camp of Newstead, and from these an almost complete skeleton has been prepared. A Scottish example of the White-beaked Dolphin, from which a mounted specimen and skeleton have been made, was presented by Mr. William Lumley, while Mr. Rowland Ward gave a fine mounted adult male of the Orang Utan. To Mr. N. B. Kinnear the museum is indebted for a large collection of British Mammals and Birds.

The most important donations to the Bird collections include a large number of skins and eggs of exotic species given by Mr. J. J. Dalgleish, and a number of Birds from Fair Isle (including several rare and interesting species), collected by myself and Mr. N. B. Kinnear.

The collection of Fishes has been enriched by a large series of exotic forms from the Godeffroy collection, presented by Dr. R. H. Traquair; and by a number of deep-sea forms given by the Fisheries Branch of the Irish Department of Agriculture.

Among additions to the Insects may be mentioned a large collection of British Hymenoptera presented by Mr. Claude Morley, one of British Neuroptera and Trichoptera, by Professor J. J. F. X. King, and several interesting specimens of British Orthoptera, by Mr. W. J. Lucas. A series of Diptera and Coleoptera from St. Kilda, from Rev. J. Waterston, a fine collection of Butterflies from Sumatra, presented by Miss Home, and two large series of Butterflies from Zomba, given, one by Mrs. H. E. Scott, the other by Mr. Charles Stuart, form important donations to the Insect collections.

To the North Sea International Investigation Committee of the Scottish Fishery Board, the Fisheries Branch of the Irish Department of Agriculture, and several private donors, the Museum is indebted for a large number of marine and other Invertebrates. For many other interesting specimens the Natural History Department has to thank their Graces the Duke and Duchess of Bedford, Sir John Kinloch, Bart., Dr. J. H. Ashworth, Dr. W. S. Bruce, Messrs. Geo. Girdwood, P. J. C. McGregor, Oldfield Thomas, and Mrs. Leslie Milne.

A set of the valuable and beautifully illustrated monographs dealing with the fauna of the Atlantic ocean has been presented by His Serene Highness the Prince of Monaco, and has proved of considerable use to the staff in the prosecution of their work.

Among the year's purchases are several of importance and of popular interest. Foremost among these are a huge male African elephant from

the Lado Enclave, and an adult male Okapi from the Ituri Forest, Congo Free State. Both of these animals rank among the finest examples of their kind ever obtained. Other purchases worthy of mention are a Serval, two Arctic Foxes, and two large collections of British Hymenoptera. The first instalment of a series of preparations to illustrate the life-histories of British Lepidoptera has also been added to the exhibited collections.

WM. EAGLE CLARKE,
Keeper of the Natural History Department.

REPORT OF THE KEEPER OF THE TECHNOLOGICAL DEPARTMENT.

In the course of last year two important models have been constructed and placed on exhibition in the mining section of the Mining and Metallurgical Hall. These models show the general arrangements of the underground workings in coal mines, and, when studied in conjunction with the models which were added to the collections last year, afford a complete view of the two chief methods of winning coal in Scotland. A model, complete in every detail, of a blast furnace of the most modern type, made in the Museum workshops from drawings supplied by the Glengarnock Iron and Steel Co., Ltd., has been added to the metallurgical collections. It shows, besides the furnace proper, the stoves for heating air to be supplied to the furnace as the hot blast. The different parts are sectioned where necessary to enable the visitor to see the constructional details. A model of a new type of furnace used in the manufacture of steel by the cementation process has also been made for the metallurgical collections, and has been carefully sectioned at numerous points in order to show the complicated arrangement of flues and other parts.

Messrs. E. Green and Son, Ltd., Wakefield, have presented a fine model of their economiser for exhibition in the boiler section of the Machinery Hall. This model, which is partly in section, is placed in its proper relation to the model of a Lancashire boiler presented last year, so that the student can at once perceive its use. A working model, showing one of the most efficient methods of driving a wire rope or cable, such as is largely adopted for haulage purposes in mines and on cable tramways and railways, has also been added to the machinery hall. The system illustrated is used in the Glasgow District Subway Railway, and it is to the engineers of that undertaking, Messrs. D. and A. Home Morton, Glasgow, that the Museum is indebted for the drawings from which the model was made. Examples of different types of driving chains for motor cars, motor omnibuses, etc., have been presented by well-known makers, and are exhibited in the same case as the cable drive model. These chains have been so arranged that they can be set in motion by the visitor. The transmission of power by belts and cotton ropes is illustrated by a number of working models set up in an adjacent case. The examples of belt drives include most of the leading types. The model of a cotton rope drive was made from drawings supplied by Messrs. Douglas Fraser and Sons, Arbroath. The valuable historical collection illustrating the development of railway permanent way has been extended by the addition of numerous specimens. Some of these specimens, for which the Museum is indebted to the North British Railway Company, are particularly interesting as examples of the earliest types of rails, chairs, and sleepers used in Scotland. In the section devoted to hydraulics examples of various types of steel water mains, showing differe methods of jointing, have been presented by Messrs. Stewarts and Lloyds, Ltd., Glasgow. An old form of Morse embosser, which will fill one of the numerous gaps in our historical collection of telegraph apparatus, has been recently acquired.

Further additions have been made to the type collection of botanical specimens in spirit, in the School Gallery, and coloured drawings of many of the plants as they appear in nature have been placed beside these specimens.

A collection illustrating insect and other pests, and the damage done by them in garden, field, and forest, has been acquired for the Economic Botany Gallery, and additions have also been made to the collection of specimens in spirit relating to the subject of forestry.

ALEXANDER GALT, D.Sc.
Keeper of the Technological Department.

DONATIONS DURING THE YEAR 1907.

ART AND ETHNOGRAPHICAL DEPARTMENT.

Mrs. Aitken, 139, Glen Park Mansions, Chelsea, London, S.W.—Hand and foot of an Egyptian mummy.

Col.-Sergt. F. G. Bertram, Northern Nigeria Field Horse.—Two quivers containing poisoned arrows from Sokoto, Northern Nigeria.

Mrs. Boswell, Trinity Road, Edinburgh.—English and Chinese porcelain, Strasburg enamelled earthenware, etc., from the collection of the late Mr. Alexander Boswell, Edinburgh.

British School of Archæology in Egypt, through Professor W. M. Flinders Petrie.—Egyptian antiquities.

Sir Thomas D. Gibson-Carmichael, Bart., Malleny, Midlothian.—Reliquary, silver-gilt, enamelled and nielloed, Spanish, fifteenth century.

Mr. James Cross, F.G.S., Church Street, Camberwell Green, London.—Smoothed celt, lancehead and arrowheads from United States, lunate scrapers from Denmark, etc.

Mr. A. Decaristo, Great Tower Street, London.—Greek rhyton.

Mr. J. Dickson, The Royal Scottish Museum.—Carved gourd from Lagos.

Edinburgh Academy, The Directors of.—Egyptian coffin and mummy, given to the Academy by Sir Colin Scott Moncrieff, K.C.M.G.

Egypt Exploration Fund, the President and Council of.—Antiquities from Deir-el-Bahari.

Geological Museum, London, The Director of.—Photographs of implementiferous gravels of Northfleet, Kent.

Mr. W. J. Hay, High Street, Edinburgh.—Silver Heart of Midlothian brooch.

Mrs. Kay, Drumpark, Dumfries.—Mosaic table, subject Pliny's doves and wreath of convolvulus, on white marble pedestal.

Dr. Mackenzie, Ramsay Garden, Edinburgh.—Photographs from Travancore.

Mr. Thomas McKie, LL.D., Edinburgh.—Collection of European porcelain, enamels, ivories, stone vases, mirrors, etc., which belonged to the late Mr. Wm. McKie, Moat House, Dumfries.

Dr. Hugh Marshall, Edinburgh University.—Hide sjambok.

Miss Peddie, 15, Rutland Street, Edinburgh.—"Tapa" cloth from Tahiti.

Miss Ruth Raeburn, Manor Place, Edinburgh.—Mexican rainproof cloak, and a basket.

Mr. James Smiles, Bruntsfield Place, Edinburgh.—Bronze Buddha from Siam.

Scottish Oceanographical Laboratory, Surgeons' Hall, Edinburgh.—Pair of "Kummins" made by natives of Four Island Point, Davis Strait.

Miss Elizabeth R. Taylor, 11, Lauriston Place, Edinburgh.—Pair of Lapp child's shoes and skein of reindeer sinew.

Mr. E. Murray Tod, Clifton.—Swansea porcelain saucer, and Bristol plate.

Mr. E. Ward, The Royal Scottish Museum.—S. African snuff spoon.

Mr. J. Watt, District Commissioner, Omorudu, Southern Nigeria.—Ethnographical specimens from Omorudu district.

Mr. T. Wharton, Stoke Newington, London.—Ebony walking stick.

NATURAL HISTORY DEPARTMENT.

The Department of Agriculture (Fisheries Branch), Ireland, per Mr. E. W. L. Holt, Scientific Adviser.—A collection of Schizopoda taken during the survey of the Western Fishing Grounds; a collection of Fishes from the S.W. of Ireland; a collection of Tunicates (*Thaliacea*).

Mr. Edwin Alexander, Shepherd House, Inveresk.—Two specimens of the Greenland Falcon (*Falco candicans*).

Miss A. E. D. Allen, Burwick, South Ronaldshay, Orkney.—Four specimens of the Orkney Vole (*Microtus orcadensis*), from South Ronaldshay, Orkney.

Mr. H. W. Andrews, F.E.S., Shirley, Welling, Kent.—Eighteen specimens of British Diptera; ten specimens of Diptera, from Stradbally, co. Waterford, Ireland, August, 1906.

The Society of Antiquaries of Scotland, National Portrait Gallery Buildings, Queen Street, Edinburgh.—Skeleton of Horse, made up of bones found at the Roman Camp, Newstead, near Melrose.

Dr. J. H. Ashworth, Zoological Department, The University of Edinburgh. Two specimens of *Arenicola marina;* two females of *Ornithodoros savignyi* from a camel, Sheikh Othman, near Aden; specimen of *Sclerostomum armatum* from peritoneal cavity of a horse; female specimen of *Stegomyia fasciata*, from Malaga, Spain; three parasitic Worms; specimens of *Ixodes ricinus* taken from Cow, Callander, September, 1906; specimen of *Dipylidium caninum*, from Fox Terrier.

Mr. Baikie, Tankerness, Orkney.—Male Red Grouse (*Lagopus scoticus*), from Tankerness, Orkney.

Her Grace the Duchess of Bedford, 15, Belgrave Square, London.—Specimen of the Marsh Tit, from Dallash, Valley of the Panure; specimens of Pintail (*Dafila acuta*), and Whistling Swan (*Cygnus columbianus*).

His Grace the Duke of Bedford, K.G., Woburn Abbey, Bedfordshire.—Specimen of Himalayan Thar (*Hemitragus jemlaicus*).

Mr. R. B. Bell, Whitehall, Stronsay, Orkney.—Specimen of the Vole, from Sanday, Orkney.

Mr. Wm. Berry, Tayfield, Newport, Fife.—Female specimen of Pochard (*Fuligula ferina*), from Tentsmuir, Fife; female specimen of Golden Pheasant (*Chrysolophus pictus*), from Tayfield, Newport, Fife; three Redshanks and three Black-headed Gulls, from Tentsmuir; adult specimen of Greenshank (*Totanus canescens*), in autumn plumage, from Tentsmuir; two specimens of Common Sandpiper (*Totanus hypoleucus*), from Tentsmuir; specimen of Merlin (*Falco æsalon*), killed on telegraph wire.

Mr. Robert V. Bethell, 342, Morningside Road, Edinburgh.—Four Mammals and seven Birds from Deseoberto, Minas, Geraes, Brazil.

Mr. D. W. Bett, L.D.S., R.C.S.E., 1, Salisbury Place, Edinburgh.—Two living Carp (*Carpinus carpio*).

Mr. John Bishop, 81, High Street, Berwick.—Two specimens of Limestone with *Sacammina carteri*, from Acre Band, L.Carb., Scremerston, near Berwick.

Mr. J. W. H. Bowhill, Morelands, Grange Loan, Edinburgh.—A collection of Insects from Cedar Creek, Yellowstone River, Montana, U.S.A., comprising 154 specimens.

The Trustees of the British Museum (Natural History), Cromwell Road, South Kensington, London.—Two hundred and seven skins of Mammals; eighteen specimens of Seals, Birds and Birds' Eggs; a collection of Marine Invertebrates.

Mr. Wm. Brown, 4, Henry Place, Edinburgh.—Large specimens of the Swimming Crab (*Portunus puber*), from Kingsbarns, Fife.

Mr. R. N. Rudmose Brown, B.Sc., Natural History Department, University of Aberdeen.—Two specimens of *Margaritifera maxima*, from the Mergui Archipelago.

Mr. Frank Balfour Browne, 2, Florenceville, Larne Harbour, co. Antrim.—Seven specimens of *Apus cancriformis*, from Southwick, Kirkcudbrightshire.

Mr. D. Bruce, Stationmaster, Dunbar.—Mounted specimen of Barn Owl (*Strix flammea*), struck by a passing train opposite Westbarns, Dunbar.

Dr. W. S. Bruce, Scottish Oceanographical Laboratory, Surgeons' Hall, Edinburgh.—Specimen of Shark from Ascension; four Arctic Foxes, and an adult and five young Sanderlings (*Calidris arenaria*), from Prince Charles Foreland, Spitsbergen.

Mr. R. Bryson, 25, West Maitland Street, Edinburgh.—Specimen of *Chimæra monstrosa*.

Mr. James Pelham Burn, Prestonfield House, Edinburgh.—Mallard (*Anas boscas*), from the Firth of Forth; Pochard (*Fuligula ferina*), from Duddingston Loch.

Mr. Hector Burn-Murdoch, Drimnin Lodge, by Oban.—Specimen of Little Grebe (*Podicipes fluviatilis*), shot on Oronsay Island, Argyllshire.

Rev. Angus Cameron, Tain.—Death's Head Moth (*Acherontia atropos*), Tain.

Mr. D. W. Cameron, of Lochiel, Achnacarry, Spean Bridge.—Fine specimen of a Trout from Loch Arkaig, Inverness-shire.

Mr. A. E. J. Carter, 4, West Holmes Gardens, Musselburgh.—Four specimens of *Hypophyllus crinipes* from Musselburgh.

Mr. C. E. S. Chambers, 44, Drumsheugh Gardens, Edinburgh.—Clutch of four eggs of the Indian Painted Snipe (*Rostratula capensis*) from the neighbourhood of Calcutta.

Miss Clarke, 4, Camden Crescent, Bath.—Six shells from North Island, New Zealand.

Mr. Wm. Eagle Clarke, The Royal Scottish Museum, Edinburgh.—Specimen of Field Mouse (*Mus sylvaticus fridariensis*) from the Fair Isle; three beetles from Assynt; young Curlew (*Numenius arquatus*) from Assynt.

Mr. W. Eagle Clarke and Mr. Norman B. Kinnear.—Ninety-four Birds from Fair Isle.

Mr. Robert Clyne, Bell Rock Lighthouse.—A collection of Marine Invertebrates and Tunicates from the Bell Rock.

Mr. A. Cochrane, 34, Cockburn Street, Edinburgh.—Specimen of a Greenfinch (*Ligurinus chloris*), and of a Skink.

Messrs. M. Cochrane and Son, 34, Cockburn Street, Edinburgh.—Two living specimens of Japanese Newt (*Molge pyrrhogastra*).

Mr. Thos. Cook, 22, Lothian Street, Edinburgh.—Male and female specimens of *Chimæra monstrosa* from the North Sea.

Mr. C. M. Corbett, Palace Mansions, London, S.W.—Three Birds from Creagorry, Benbecula.

Mr. T. A. Coward, Brentwood, Bowden, Cheshire.—Specimens of *Nycteribia hermanni*, taken from *Rhinolophus hipposiderus* at Cheddar, Somerset.

Mr. J. J. Dalgleish, Brankston Grange, Bogside Station, Stirling.—A collection of Birds' Eggs, comprising 702 specimens; twenty skins of Exotic Birds.

Mr. A. J. H. Edwards, The Royal Scottish Museum, Edinburgh.—Female Grivet Monkey (*Cercopithecus griseo-viridis*).

Mrs. Douglas Edwards, 3, Frederick Street, Edinburgh.—Specimen of the Paddle Worm (*Phyllodoce lamelligera*) from Hopetoun, Firth of Forth.

Mr. J. H. E. Elliot, 16, Royal Crescent, Edinburgh.—Three nests of Weaver Birds from South Africa.

Mr. L. G. Esson, 383, George Street Aberdeen.—Specimen of *Astromyx loveni*, found on a trawl boat at Aberdeen.

Prof. J. Cossar Ewart, F.R.S., The University, Edinburgh.—Body of Celtic Pony.

Mr. Wm. Evans, F.R.S.E., 38, Morningside Park, Edinburgh.—Specimens of Scaup (*Fuligula marila*); Wigeon (*Mareca penelope*) from Dunbar: specimen of a Black Sea Bream (*Cantharus cantharus*) from the Firth of Forth.

Col. Fergusson-Buchanan, Auchentorlie, Dumbartonshire. — Female variety of the Red Grouse (*Lagopus scoticus*) from Auchentorlie; a pair of claws of the Grouse showing change of nails; hen Pheasant (*Phasianus colchicus*) with spurred foot.

The North Sea International Investigations Committee of the Fishery Board of Scotland.—A collection of Marine Invertebrates from the North Sea.

Lady Fowler, Inverbroom, Garve, Ross-shire.—Field Mouse (*Mus sylvaticus*) from Inverbroom.

The family of the late Major G. B. French, M.B., C.M., L.R.C.P., per Lawford. Waterhouse, and Lawford, 23, Austin Friars, London, E.C. Specimens of Skulls and Horns.

Mr. C. J. Gabriel.—A collection of Molluscan shells from Victoria, Australia.

Mr. J. K. Galloway, Procurator Fiscal, Lerwick, Shetland.—Three surrendered Eggs of Skuas from Hascosay, Shetland, taken June, 1907.

Dr. O. H. Garland, 53, Charlotte Street, Leith.—Specimen of *Panchlora nivea*.

Mr. J. K. Garraway, 13, South Charlotte Street, Edinburgh.—Five Specimens of the female of *Orgyia antiqua*, bred from larvæ obtained on Luther Muir, near Montrose.

Mr. Geo. Girdwood.—Young (in down) of Great Skua (*Megalestris catarrhactes*).

Mr. Oxley Crabham, The Museum, York.—Two Bats from Thornton Dale, near Pickering, York; specimen of Lesser Horse-shoe Bat.

Mr. D. Hamilton, 63, Warrender Park Road, Edinburgh.—Specimen of young Long-eared Owl (*Asio otus*) from Pentland Hills; young Ring Ousel (*Turdus torquatus*) from the Pentland Hills.

Mr. J. A. Harvie-Brown, Dunipace, Larbert.—Variety of Wood Pigeon (*Columbus palumbus*) from Belmont Castle, Perthshire; two specimens of Mountain Hare (*Lepus timidus*) from Denny; Lesser Black-backed Gull (*Larus fuscus*) from Denny Hills, Firth of Forth.

Mr. Carl F. Herlofson, Bunaveneader, Isle of Harris.—Skeleton and plates of Baleen of the Atlantic Right Whale (*Balæna glacialis*); ten plates of Baleen of various species of Whale, and seven specimens of a Copepod parasitic on *Balæna glacialis*.

Mr. T. Henderson, jun., Spiggie, Dunrossness, Shetland, specimen of the Great Crested Grebe (*Podicipes cristatus*) from Loch Spiggie, Dunrossness.

Lady Estella Hope, High Hallender Farm, Under River, Sevenoaks, Kent.—Specimen of *Lepus timidus*, var. *lutescens*, from Malhide, Dublin.

Miss Horne, 5, Upper Gray Street, Edinburgh.—One hundred and thirty specimens of Lepidoptera from Sumatra.

Master W. L. Hunter, 9, Maxwell Street, Edinburgh.—Seventy-two specimens of Insects, chiefly Butterflies, from Mount Ayliff, Griqualand East, South Africa.

Mrs. Hunter-Weston, Hunterston, West Kilbride.—Specimen of Peacock (*Pavo cristatus*).

Miss Inglis, 10, Dick Place, Edinburgh.—Specimen of *Panchlora nivea* imported into Edinburgh with bananas from Jamaica.

Miss Dorothy Jackson, Swordale, Evanton, Ross-shire.—Twenty-one specimens of Lepidoptera from Swordale, East Ross-shire.

Messrs. Johnston, Green and Co., Ltd., Fish and Game Dealers, 3, South Charlotte Street, Edinburgh.—Specimen of Muller's Topknot (*Zeugopterus punctatus*) caught 40 miles east of the Isle of May.

Mr. Ewen Kennedy, care of Mr. Drysdale, The Leuchold, Dalmeny.—Stuffed specimen of Greater Black-backed Gull (*Larus marinus*), male.

Prof. J. J. F. X. King, F.E.S., 1, Athole Gardens Terrace, Kelvinside, Glasgow.—A collection of British Neuroptera and Trichoptera, comprising 454 specimens.

Sir John Kinloch, Bart., Glenisla House, Alyth.—Male specimen of the Canada Goose (*Bernicla canadensis*) shot by Miss Kinloch, of Kinloch, on Auchentapple Loch, Glenisla, 1907.

Mr. Norman B. Kinnear, 12, Grosvenor Crescent, Edinburgh.—A collection of Fossils formed by the late Sir William Jardine, Bart., chiefly from Malta and the Isle of Wight; female specimen of the Barn Owl (*Strix flammea*) from Kildalton, Islay; male and female specimens of the Lesser Shrew (*Sorex pygmæus*) from Lochmaddy, North Uist; twenty-two specimens of British Birds.

Mr. Charles Kirk, 156, Sauchiehall Street, Glasgow.—Specimen in the flesh of Yellow Baboon (*Papio cynocephalus*); young specimen of the Long-eared Owl (*Asio otus*); ten British Birds.

Mr. T. Kirkpatrick, Royal Scottish Museum, Edinburgh.—Specimens of a Polyzoon (*Membranipora pilosa*) spreading over a frond of *Laminaria saccharina* from the shore at Gullane; specimen of Swift (*Cypselus apus*), male, Edinburgh.

Prof. E. Ray Lankester, F.R.S., British Museum (Natural History), Cromwell Road, London, S.W.—Casts of two skulls of the Okapi.

Mr. J. R. Laurence, Pentland Skerries, St. Margaret's Hope, Orkney.—Two specimens of Birds from Pentland Skerries, Orkney.

Mr. O. A. J. Lee, East Mains, Callander.—Two young Greenshanks (*Totanus canescens*) from Rothiemurchus Forest, Inverness-shire.

Mr. R. G. Linton, Thorpe Corrage, Herningford Grey, St. Ives, Hants.—Specimen of *Leptophyes punctatissima* from St. Ives, Huntingdonshire.

Mr. W. J. Lucas, F.E.S., 28, Knight's Park, Kingston-on-Thames.—Seven specimens of *Agrion pulchellum* from Byfleet Canal, Surrey; three specimens of the Shore Earwig (*Labidura riparia*) taken on the Hampshire coast; fifty-three specimens of Orthoptera and Neuroptera from Surrey and the New Forest.

Mr. Wm. Lumley, The Inn, Cramond.—Adult male White-beaked Dolphin (*Lagenorhynchus albirostris*) from Cramond, Firth of Forth.

Mr. Wm. L. Macgillivray, Eoligary, Barra, by Oban.—A partial albino of the Brown Rat (*Mus decumanus*) from Barra.

Mr. P. J. C. McGregor, British Embassy, Constantinople —Female specimen of *Parus major*, Semisova; 130 specimens of Birds' Eggs.

Mr. D. C. McIntosh, M.A., B.Sc., 37, Warrender Park Terrace, Edinburgh.—Specimens of British Hydroids.

Mr. P. M. McIntyre, care of McKay, 31, Castle Street, Edinburgh.—Specimen of long-spined Sea Bullhead (*Cottus bubalis*) from the Firth of Forth.

Mr. Hugh Mackay, The Royal Scottish Museum, Edinburgh.—Five mounted British Birds.

Mr. James McKay, The Royal Scottish Museum, Edinburgh.—Specimen of female Cockroach (*Periplaneta orientalis*), carrying egg-case partially extruded, captured in Museum.

Mr. John MacKay, Stromness Hotel, Stromness.—Specimen of Trout (*Salmo fario*), from Loch Stennis, Orkney. Weight, 8 lbs.

Mr. Duncan MacKenzie, Royal Hotel, Stornoway.—Female specimen of Tufted Duck (*Fuligula cristata*), from Stornoway; specimens of Knot (*Tringa canutus*) and Bar-tailed Godwit (*Limosa lapponica*), from Stornoway; specimen of Iceland Gull (*Larus leucopterus*), from Stornoway.

Mr. John McKenzie, 51, Beechgrove Terrace, Aberdeen.—Specimens of a Tubularian, found growing on a tree dredged from the Firth of Forth.

Mr. J. T. MacKenzie, Dunvegan, Skye.—Specimen of *Mus hirtensis*, killed on Dun Island, St. Kilda group.

Mr. James S. McLaughan, Hawthorne Bank, Haddington.—Specimen of Bird-eating Spider, from River Plate, near Buenos Ayres.

Mr. Wm. MacLennan, Grainbank, Kirkwall, Orkney.—Female specimen of Black Rat (*Mus rattus*), from South Rolandshay.

Mr. James McQuarrie, Nouphead Lighthouse, Westray, Orkney.—Specimen of Water Rail killed by striking the windows of Nouphead Lighthouse.

Mr. David MacRitchie, 4, Archibald Place, Edinburgh.—Female specimen of *Æschna juncea*, from Newton Dee, near Aberdeen.

Mr. John Mathieson, Stourhead Lighthouse, Lochinver, Lairg, Sutherlandshire.—Specimen of the Thorny Lobster (*Palinurus vulgaris*), found in a crab-pot off Stourhead.

Mr. Charles G. Matthew, Fleet Surgeon, H.M.S. Monmouth, China Station, Hong Kong.—Skull of *Cervulus* sp., from Hong Kong.

Mr. J. G. Millais, Compton's Brow, Horsham.—Three skins of British Seals.

Mrs. Leslie Milne, c.o. Post Office, Bhamo, Upper Burma.—One hundred and twelve shells of Mollusca, from Port Blair, Ross Island, Andaman Islands; miscellaneous collection, comprising 34 specimens.

Mr. John Moir, Gamekeeper, Garden, Stirlingshire.—Specimen of Hedgehog (*Erinaceus europæus*), from Garden, Stirlingshire.

Mr. Claude Morley, F.E.S., The Hill House, Monk's Soham, Suffolk.—A collection of British Hymenoptera, comprising 822 specimens.

Mr. Cyril Morgan-Brown, c.o. Rev. C. Ll. Sanctuary, The Close, Salisbury.—Specimen of Nuthatch (*Sitta cæsia*), from Haslemere, Surrey.

Mr. J. Kirke Nash, L.D.S.Ed., 21, Alva Street, Edinburgh.—Chick of Mallard (*Anas boscas*), from the Lake of Menteith.

Mr. Geo. Nelson, Dunmore Cottage, Shotts, Lanarkshire.—Specimen of a bifid Worm (*Lumbricus minor*), from Shotts.

Mr. T. H. Nelson, Cliffe, Redcar, Yorkshire.—Specimens of *Parthemisto oblivio*, from the shore at Redcar, Yorkshire.

Mr. Patterson, Gamekeeper, Morton Hall, Edinburgh.—Specimen of a White Stoat (*Mustela erminea*).

M. Marc Planton, Arles-sur-Rhone.—Two Eggs of the Flamingo (*Phœnicopterus roseus*), from the Camargue, South France.

Mr. C. H. Scott Plummer, Sunderland Hall, Selkirk.—Female hybrid between male Golden Pheasant (*Chrysolophus pictus*) and female Common Pheasant (*Phasianus colchicus*), from Sunderland Hall.

Mr. Lewis G. Ramsay, 11, College Bounds, Aberdeen.—Thirty-seven specimens of Insects from Kara Dagh, Asia Minor; a collection of Birds' Eggs from Kara Dagh.

Misses Leonora J. Rintoul and Evelyn V. Baxter, Lahill, Largo, Fife.—Female specimen of the Horse Bot Fly (*Gastrophilus equi*), from Fryern, Pulborough, Sussex.

Mr. James Ritchie, The Royal Scottish Museum, Edinburgh.—Two Hydroids and two Polyzoa, from the North Sea.

Mr. Lewis B. Robb, 67, East North Street, Aberdeen.—Melanic specimen of the Common House Mouse (*Mus musculus*).

Captain Robertson, of the "Scotia,' Prosen Cottages, Tayport, Fife.—Skeleton of Walrus (*Odobenus rosmarus*).

Mr. A. M. Rodger, Perthshire Natural History Museum, Perth.—Specimen of a White Whale (*Delphinapterus leucas*) fœtus, from Prince Regent's Inlet, Lancaster Sound, Davis' Straits.

The Hon. Walter Rothschild, M.P., Tring Park, Herts.—Coloured cast of *Lophius piscatorius;* four specimens of exotic Fishes mounted and painted in natural colours; specimen of the Shark (*Odontaspis saurus*), from the Cape of Good Hope.

Mr. Theodore Salvesen, 29, Bernard Street, Leith.—Complete set (68) of the teeth of a bull Sperm Whale (*Physeter macrocephalus*), caught off Shetland; Foetus of a Finner Whale (*Balænoptera musculus*); complete skeleton of a Bottle-nose Whale (*Hyperoodon rostratum*), from Shetland.

Dr. E. T. Edmonston Saxby, Halligarth, Balta Sound, Shetland.—Specimen of the White-fronted Goose (*Anser albifrons*), from Halligarth.

Mrs. H. E. Scott, c.o. Mrs. Govan, 31, Comely Bank Road, Edinburgh.—A collection of Insects, chiefly Butterflies, from Zomba, British Central Africa.

Mr. Robert Service, Maxwelltown, Dumfries.—Specimen of Millepede found in a box of Bitter Oranges, from Spain; specimen of Starling (*Sturnus vulgaris*), with abnormally long bill; specimen of the Bird-eating Spider, imported with fruit.

Dr. David Sharp, F.R.S., University Museum of Zoology, Cambridge.—Female specimen of *Ctenophora ornata*, from Brockenhurst, New Forest, bred 13th August, 1907.

Mr. Fred Smalley, Challan Hall, Silverdale, Carnforth, Lancashire.—Specimen of Velvet Scoter (*Œdemia fusca*), male.

Miss Sprague, 29, Buckingham Terrace, Edinburgh.—Specimen of *Chrysis ignita*, from Holne Cross, Ashburton, S. Devon.

Mr. R. A. Staig, Natural History Department, The University, Glasgow.—Eight specimens of *Glossina palpalis*, from 25 miles inland from the Gold Coast, West Africa.

Mr. J. A. Steuart, Westwood, West Lothian.—Melanic specimen of Rabbit (*Lepus cuniculus*).

Mr. W. J. Stevenson, Blairennich, Stirling.—Variety of the Common Snipe (*Gallinago cœlestis*), shot at Cowie, Old Polmaise.

Mr. Charles Stuart, 67, Braid Road, Edinburgh.—A collection of Butterflies from Zomba, British Central Africa, comprising 93 specimens.

Mr. D. Tait, Sule Skerry Lighthouse, Stromness.—Specimen of Fork-tailed Petrel (*Oceanodroma leucorrhoa*), from Sule Skerry Lighthouse.

Mr. Wm. Taylor, Llanbryde, near Elgin.—Specimen of the Golden Eye (*Clangula glaucion*).

Mr. Oldfield Thomas, F.R.S., British Museum (Natural History), Cromwell Road, London, S.W.—Fifty-seven Mammal Skins and Skulls from South America, collected by Mr. P. O. Simons.

Professor D'Arcy W. Thompson, C.B., University College, Dundee.—Stuffed specimen of *Phoca equestris*, from Behring Straits.

Mr. James Tomison, Skerryvore Lighthouse, Fionphort, near Oban.—Specimen of Missel Thrush (*Turdus muscivorus*), from Skerryvore.

Mr. R. Tomlinson, Musselburgh.—Two specimens of the Blue-tailed Skink (*Eumeces quinquelineatus*), imported in timber from North America.

Mr. Ramsay Traquair, The Bush, Colinton.—Specimen of Trout (*Salmo fario*), from Tweed above Innerleithen.

Dr. R. H. Traquair, F.R.S., The Bush, Colinton.—A collection of Fishes from the Museum Godeffroy, comprising 678 specimens.

Mr. R. D. R. Troup, 21, Marchmont Road, Edinburgh.—Specimen of *Helodes marginata*, from Currie; also a number of larvæ of a Sawfly, from Wells, Somerset; brown variety of Viper (*Pelias berus*), from Wells, Somerset.

Mr. H. M. Vickers, 9, Viewforth Gardens, Edinburgh.—Two specimens of *Pyrochroa serraticornis*, bred from larvæ found at Wells, Somerset.

Mr. H. M. Wallis, Ashton Lodge, Reading.—Female specimen of Green Woodpecker (*Gecinus viridis*), from Reading; male specimen of Green Woodpecker, from Reading.

Mr. D. R. P. Walther, 32, Greenhill Gardens, Edinburgh.—Two specimens (males, adult and juv.) of the Velvet Scoter (*Œdemia fusca*), from Firth of Forth.

Mr. Rowland Ward, 167, Piccadilly, London, W.—A number of bones of the Okapi (*Ocapia johnstoni*), from the forests of the Upper Congo.

Rev. James Waterston,, B.D., B.Sc., 9, Woodburn Terrace, Edinburgh.—Two specimens of *Anodonta anatina* from Lochgelly; one hundred and fifty specimens of Diptera, from the Island of Hirta, St. Kilda.

Mr. James Watson, c.o. Messrs. J. Jamieson and Son, 58, Castle Street, Edinburgh.—Male and female specimens of *Chimæra monstrosa*, from the North Sea.

Mr. W. Wesché, 125, Biddulph Mansions, Elgin Avenue, London, W.—Four specimens of British Diptera.

Mr. Stewart Wilson, Kennabey, Fair Isle.—Young Storm Petrel (*Procellaria pelagica*), from Fair Isle.

Mr. Frank Woolnough, Ipswich Museum and Free Library, Ipswich.—Two casts of Eggs of the Great Auk (*Alca impennis*).

Mr. James Wright, 36, Douglas Street, Kirkcaldy.—Five specimens of Fish remains, from Abden, near Kinghorn, and Cults, near Cupar.

Technological Department.

Messrs. Wm. Anderson & Co., Drumcavil Sand Works, Gartcosh.—Specimens of firebricks and sand.

The Associated Portland Cement Manufacturers (1900), Ltd., 72, Fenchurch Street, London, E.C., per Messrs. Johnstons, Ltd., 13, Frederick Street, Edinburgh.—Specimens illustrating the manufacture of Portland cement.

Mr. A. Baird, Rosemount, Glenboig, Lanarkshire.—Specimens of firebricks and sand.

Messrs. Baird and Stevenson, 13, Carlton Place, Glasgow.—Specimen of building stone.

The Bothwell Park Quarries and Brick Works, Ltd., by Bothwell, Lanarkshire.—Specimen of building stone.

Messrs. Brampton Bros., Ltd., Oliver Street Works, Birmingham.—Specimens of chains for motor cars and motor omnibuses.

The British Thomson-Houston Co., Rugby.—Three photographs of Curtis steam turbines.

Miss Brown, Pinkie Mains, Musselburgh.—Collection of Herbarium specimens.

The Broxburn Oil Company, Ltd.—Five photographs illustrating different parts of Broxburn Oil Works.

The Budhill Sandstone Co., Shettleston, Glasgow.—Specimens of sand.

Callender's Cable and Construction Co., Ltd., Hamilton House, Victoria Embankment, London.—Five specimens of electric cables, such as are used in mines.

Mr. David W. Campbell, Breckonhill, Lockerbie.—Branch of tree with web enclosing cocoons of the Ermine Moth.

The Chief Engineer, Great Western Railway, Paddington Station, London.—Length of bridge rail, laid by Brunel about the year 1837-8.

Mr. Alex. Clark, 51, East Trinity Road, Leith.—Model illustrating pile driving; also models of the following: Derrick crane, donkey boiler, water wheel, and double-acting pump.

Mr. E. J. Craig Christie.—Specimen of rubber milk from Benin coast.

Messrs. Davidson & Co., Ltd., Sirocco Works, Belfast.—Model of Sirocco mine fan wheel.

Messrs. Doulton & Co., Ltd., Lambeth, London, S.E., and 38, Bothwell Street, Glasgow.—Numerous models of sanitary appliances.

The Edinburgh Roperie and Sailcloth Co., Leith.—Specimens of driving ropes, etc.

The Eglinton Silica Brick Co., Ltd., Dundyvan, Coatbridge. Head office, 60, Firhill Road, Glasgow. — Specimens of bricks and raw materials.

Messrs. Escher, Wyss & Co., Zurich, per Mr. Jens Orten-Boeving, 72, Victoria Street, London, S.W.—Collection of photographs illustrating Zoelly steam turbines.

Ewart's Chain Manufacturing Co., Colombo Street, Derby.—Specimens of driving chains.

Mrs. Farquharson, 47, Mardale Crescent, Edinburgh.—Collection of Herbarium specimens.

The Glenboig Union Fireclay Co., Ltd., Glasgow.—Specimens of bricks and raw materials.

Messrs. E. Green and Son, Ltd., Wakefield.—Model of Green's Economiser.

The Heathfield and Cardowan Fireclay Co., Garnkirk. Office, 52, Robertson Street, Glasgow.—Specimen of brick and raw materials.

Mr. Wm. Johnstone, Gartcraig, Glasgow.—Specimen of whin sett for roads.

Croy Quarry, Kilsyth.—Specimen of whin sett for roads.

Cranhill Quarry, Milncroft.—Specimen of road metal.

Messrs. Mitchell, Westbank Brick Works, Portobello.—Specimen of bricks and raw material.

Messrs. J. and J. Neilson, Quarrymasters and Contractors, 102, Bath Street, Glasgow.—Specimen of whin sett for roads.

The Niddrie and Benhar Coal Co., Ltd.—Specimen of Great Seam Cannel Coal.

The North British Railway Company, Edinburgh.—Historical collection of railway rails, chairs, and sleepers.

Messrs. Pfeil and Co., 145, St. John Street, Clerkenwell, London, E.C.—Wooden belt pulley.

Mr. Max Poser, Messrs. Carl Zeiss, 29, Margaret Street, Regent Street, London.—Two lantern slides of balloons.

The Premier (Transvaal) Diamond Mining Co., Ltd., 25, Austin Friars, London, E.C.—Model of the Cullinan Diamond.

Mr. Purdie, Builder, Coatbridge.—Specimen of building stone.

Messrs. Redpath, Brown and Co., Ltd., St. Andrew's Steel Works, Edinburgh.—Specimen showing in section four types of rivets.

Messrs. Hans Renold, Ltd., Progress Works, Manchester.—Specimens of chains for motor cars, motor omnibuses, etc.

The St. Helens Cable and Rubber Co., Ltd., Warrington.—Three specimens of electric cables such as are used in mines.

Mr. James Sharp, 19, Warrender Park Crescent, Edinburgh.—Walking stick made from the wood of the broom.

Steins Brick Works, near Old Anchor Ironstone Pit, Denny.—Specimen of brick.

Messrs. Stewarts and Lloyds, Ltd., 41, Oswald Street, Glasgow.—Six specimens showing different types of steel pipes.

Mr. Clement E. Stretton, Saxe-Coburg House, Leicester.—Specimen of Stephenson and Vignole's flat-foot rail, 1836.

The Tilbury Contracting and Dredging Co., Ltd. (1906), late Messrs. F. A. Hughes and Co., Inverkeithing.—Specimens of road metal and specimen of building stone.

Mr. Troup, Quarrymaster, Craigmillar.—Specimen of building stone.

Messrs. Turners, Ltd., Portobello.—Specimens of bricks.

Canon Vaughan, Droxford Rectory, Hampshire.—Specimen of Sea Pea (*Lathyrus maritimus*).

The Whitehill Brick and Fireclay Works, Rosewell, Midlothian.—Specimens of bricks and raw materials.

Geological Department.

Mr. R. V. Bethell, 342, Morningside Road, Edinburgh.—Specimens of gold quartz from Brazil.

Messrs. The Broxburn Oil Co., Broxburn.—Samples of oil-shale from Broxburn.

Mr. Corbet S. Catty, 48, Nightingale Road, Southsea, Hants.—Specimens of graphite from Invergarry.

Mr. A. Craig Christie, Sir William Fraser's Homes, Colinton.—Specimens of labradorite and saponite from Corstorphine Hill.

Mr. J. G. Duncan, The Royal Scottish Museum.—Specimens of *Phillipsia Eichwaldi* from Leslie, Fife.

Mr. J. A. G. Elliot, The Royal Scots Fusiliers, United Service Club.—Specimens of crocidolite from Cape Colony.

Mr. W. T. Gordon, M.A., Edinburgh University. — Specimens of *Phillipsia Eichwaldi* from Leslie, Fife.

The late Dr. Gubbin, Bristol.—Collection of about 20,000 fossils from various geological formations. (Bequest.)

Mr. J. D. Gunn, Kyleakin, Skye.—Specimens of bog iron ore from Skye.

Mr. C. B. Meldrum, of Dura and Balmungo, St. Andrews.—Specimens of *Holoptychius Flemingii* and *Glyptopomus Kinnairdi* from Dura Den.

Mrs. Leslie Milne.—Specimens of ruby, sapphire, spinel, etc., from Mogok, Burma.

Mr. J. M. Moubray, The Kafue Development Co., N.W. Rhodesia.—Specimens of hopeite from Broken Hill, Rhodesia.

Mr. A. G. Ogilvie, 15, Evelyn Gardens, London, S.W.—Specimens of pyrrhotite and graphite from Perthshire.

Mr. A. Reid, F.S.A., Edinburgh.—Septarian nodule from Holyrood.

Mr. P. C. Tarbutt, 23, St. Swithin's Lane, London, E.C.—Specimens of hopeite and tarbuttite from Broken Hill, Rhodesia.

Mr. Alexr. Thoms, F.R.S.E., 7, Playfair Terrace, St. Andrews.—A series of crystal models in iron. Specimens of zinnwaldite from Ballater and of agates from Dunbog.

Dr. R. H. Traquair, The Bush, Colinton.—Specimen of *Coccosteus decipiens* from Achanarras, Caithness.

Mr. James Wallace, The Brake, Stravithie, R.S.O.—Specimens of rough and cut jade from Tawmaw, Burma.

LIBRARY.

Imperial German Government.—Erläuterungen zur Geologischen Karte von Preussen und benachbarten Bundesstaaten, Lieferungen 112, 115, 121, 123; Das Devon des Nördlichen Oberhazes, von L. Beushausen; Geologisch-agronomische Darstellung der Umgebung von Geisenheim am Rhein; Geologisch-hydrologische Verhältnisse im Ursprungsgebiete der Paderquellen zu Paderborn, von H. Stille.

Ministère des Travaux Publics, Paris.—Notice sur de Port le Saint-Nazaire.

Département de l'Intérieur, Brussels.—Annales du Musée du Congo, Tome II., Fasc. 1; Dictionnaire Kitabwa-Français et Français-Kitabwa, par Rev. A. van Acker.

India Office.—Fauna of British India, Butterflies, Vol. II., and Rhynchota, Vol. IV., Part I.; Linguistic Survey of India, Vol. IV.; Palaeontologia Indica, New Series, Vol. II., Memoir 3, and Diener's Flora of the Himalayan Muschelkalk.

Government of Bengal.—Report of the Eastern Archæological Circle for 1905-06.

Government of Bombay.—Progress Report of the Archæological Survey of the Western Circle, July, 1905, to March, 1906.

Government of the United Provinces, India.—Reports of the Archæological Surveyor, Northern Circle, for the years ending 31st March, 1906 and 1907; Report of the Superintendent of the Northern Circle for the year ending 31st March, 1907.

Government of Madras.—Report of the Southern Circle of the Archæological Survey of India for the year 1906-07.

Superintendent of the Archæological Survey of India, Frontier Circle. —Report for the year 1906-07.

Superintendent of Government Printing, Burma.—Report of the Archæological Survey of Burma for the year ending 31st March, 1907.

Superintendent of Government Printing, Calcutta.—Archæological Survey of India, Report on Epigraphy for the Southern Circle for the year 1906-07; Agricultural Ledger, 1905, Part 8, and 1906, Parts 3 to 8.

Government of Canada.—Report of the Department of the Interior for the year 1905-06.

Geological Survey of Canada.—28 publications of the Survey.

Trustees of the British Museum.—British Bloodsucking Flies; Catalogue of Lepidoptera Phalaenae, Vol. VI.; Catalogue of Madreporarian Corals, Vol. VI.; Guide to the Exhibition of Old Natural History Books; Guide to the Great Game Animals (Ungulata); History of the Natural History Collections, Vol. II.; Kirby's Synonymic Catalogue of Orthoptera, Vol. II.; Monograph of Culicidæ, Vol. IV.; Guide to Fossil Invertebrate Animals; List of Casts of Fossils, 5th edition; Catalogue of the Greek Coins of Phrygia, by Barclay V. Head; Guide to the Books and Portraits illustrating the History of Plant Classification exhibited in the Department of Botany; Reproductions from Illuminated Manuscripts, Series I. and II.; Subject Index of Modern Works added to the Library in 1901-05; Reproductions of Prints, Third Series, Part I.; Memorials of Linnæus; National Antarctic Expedition, 1901-04, Natural History, 3 vols.; List of British Seed-Plants and Ferns.

Board of Education.—Ancient and Modern Ships, by Sir G. C. V. Holmes, Parts I. and II.; Catalogue of Oil Paintings in the National Gallery of British Art, Part I.; Report of the Victoria and Albert Museum for 1905; Twelve Delft Plates in the Victoria and Albert Museum illustrating the Tobacco Industry; Catalogue of the Curzon Loan Collection of Eastern Art Objects in the Bethnal Green Museum; National Competition, 1907; Syllabuses and Lists of Apparatus applicable to Technical Schools, etc.

Scotch Education Department.—Report of the Committee of Council on Education in Scotland for the year 1906-07, with Appendix; Report by Dr. Struthers on Secondary Education (Scotland) in 1907; Return of Expenditure from Grant for Public Education in Scotland, 1906; Teachers' Certificates, 1906; Lists of Classes conducted under the Con-

tinuation Class Code, etc.; List of School Boards, Voluntary Schools, etc., January, 1907; Code of Regulations for Day Schools, with Appendixes, 1907; Code of Regulations for Continuation Classes, 1907; Cleansing and Disinfecting of Schools; Memo. on the Teaching of English in Primary Schools; Teaching of Arithmetic in Primary Schools; Study of Languages; Teaching of Drawing; Study of History; Notes in regard to the Syllabus of Physical Exercises for Use in Elementary Schools; Regulations and Syllabus, King's Scholarship Examination, 1907; Regulations and Syllabus for Examination for Teachers' Certificates, July, 1907; Regulations for the Preliminary Education, Training, and Certification of Teachers, 1907; Regulations as to Grants to Secondary Schools, 1907; Report on the Physical Condition of School Children in Glasgow; 5 volumes of the Accounts of the City of Paris; 15 volumes of the Accounts, etc., of the Département de la Seine, Paris.

Board of Agriculture and Fisheries.—Prices and Supplies of Corn, Live Stock, etc., in 1906.

Department of Agriculture and Technical Instruction for Ireland (Fisheries Branch).—Report on Sea and Inland Fisheries for 1904, Part 2; Scientific Investigations, 1905, Part 8; 1906, Part 4.

Director of the Dublin Institutions of Science and Art.—Report for the years 1905-06 and 1906-07.

Royal Dublin Society.—Economic Proceedings, Vol I., Parts 9 to 11; Scientific Proceedings, New Series, Vol. XI., Nos. 13 to 20; Scientific Transactions, Second Series, Vol. IX., Parts 4 to 6.

Meteorological Office, London.—Report for the year ending 31st March, 1907; Hourly Readings, 1905 and 1906; Meteorological Observations at Stations of the Second Order, 1902; Hints to Meteorological Observers in Tropical Africa.

Trustees of the Indian Museum, Calcutta.—48 publications of the Museum.

Madras Government Museum.—Report for the year 1906-07; The Village Deities of Southern India.

Australian Museum, Sydney, N.S.W.—Report for the year ending 30th June, 1906; Memoirs, Vol. IV., Part 10; Records, Vol VI., Nos. 4 and 5.

Albany Museum, Grahamstown, South Africa.—Records, Vol. II., Part 1.

Natal Government Museum, Pietermaritzburg.—Annals, Vol. I., Part 2; Report for 1905.

Rhodesia Museum, Bulawayo.—Report for 1906.

Tokyo Zoological Society.—Annotationes Zoologicae Japonenses, Vol. VI., Part 1.

Brazilian Legation, London.—The United States of Brazil.

Boston, U.S.A., Museum of Fine Arts.—Handbook.

Carnegie Museum, Pittsburgh, U.S.A.—Report for the year ending 31st March, 1907.

Brooklyn Institute of Arts and Sciences.—Report of the Museums for 1906; Guide to the South-western Indian Hall; Science Bulletin, Vol. I., Nos. 4 and 10.

Bureau of American Ethnology.—Reports for the years 1902-03 and 1903-04; Handbook of American Indians North of Mexico, Part 1.

Field Natural History Museum, Chicago, U.S.A.—5 publications of the Museum.

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GOVERNMENT LABORATORY.

REPORT

OF THE

PRINCIPAL CHEMIST

OF THE

GOVERNMENT LABORATORY

UPON THE WORK OF THE LABORATORY

For the Year ended 31st March, 1908.

WITH APPENDICES.

Presented to both Houses of Parliament by Command of His Majesty.

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TO THE LORDS COMMISSIONERS OF HIS MAJESTY'S TREASURY.

MAY IT PLEASE YOUR LORDSHIPS.

I HAVE the honour to submit my report on the work of the Government Laboratory for the year ended 31st March, 1908.

The business of the Government Laboratory may be divided into three classes, viz., (I) work in connection with the Revenue Departments, (A) Customs, (B) Excise; (II) work in connection with other Government Departments; and (III) work in connection with the administration of the Food and Drugs Act, and Fertilisers and Feeding Stuffs Act.

The main volume of the work in connection with the Customs is carried on in the Customs Branch of the Government Laboratory at the Custom House, E.C., and at eighteen testing stations in London and the Outports maintained by the Board of Customs. A considerable number of Customs samples, however, of tobacco and imported dairy products are examined at the Inland Revenue Branch of the Government Laboratory, Clement's Inn Passage, Strand, W.C.

The work in connection with the Excise Department is carried on at the Clement's Inn Laboratory, and at eleven chemical stations in the Provinces maintained by the Board of Inland Revenue. The analytical work undertaken for other Government Departments and the analysis of samples referred to us under the Sale of Food and Drugs Act, and the Fertilisers and Feeding Stuffs Act, is performed at the Clement's Inn Laboratory.

The total number of analyses and examinations made in the two branches of the Government Laboratory during the year ended 31st March, 1908, is 191,034, against 173,606 for the preceding year.

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I. (A)—CUSTOMS.

The articles examined in the Customs Branch of the Government Laboratory may be conveniently classified as follows :—

1.—Goods tested for liability to spirit duty :—
Beer, spirits, wine, and preparations containing spirit.

2.—Dry goods :—
Coffee, chicory, cocoa, dried fruit, tea, tobacco, &c.

3.—Sugar and Sugar products (Imports) :—
Composite goods, molasses, glucose, and saccharin.

4.—Sugar and Sugar products (Exports) :—
Biscuits, confectionery, preserves, syrup, &c.

5.—Miscellaneous :—
Refinery products, and re-tests of samples tested at local testing stations.

6.—Hydrometers and gauging instruments.

The total number of analyses and examinations made during the year was 52,775, showing a slight increase on the preceding year when the number was 52,288.

TABLE 1.—Goods Tested for Liability to Spirit Duty.

Tariff Article.	Description of Samples.	Number.
Beer	For original gravity	2,264
Cider	For genuineness and liability to duty	41
Spirits	Enumerated (brandy, rum, and Geneva) for obscuration	1,187
	Liqueurs for alcoholic strength	1,262
	Methyl alcohol, wood spirit, and petrol	193
	Unenumerated spirits (whisky, &c.)	141
Wines, &c. ...	For alcoholic strength	13,061
	For re-test as to description and rating	499
	Wine lees, finings, &c.	12
	Vinegar and acetic acid for denaturing unsound wine ...	68
Spirit preparations	Lime and other fruit juices, fortified with, and fruits preserved in spirit, and grape juice	524
	Blacking and polishes	292
	Drugs, medicinal and toilet preparations	2,801
	Flavouring essences, essential oils, and perfumery ...	1,786
	Fusel oil, pear oil, &c.	92
	Soaps, fats, and oils	233
	Inks, painters' colours, and varnishes	658
	Spent peel, sloes, &c.	42
	Yeast	22
	Chloroform, chloral hydrate, and collodion	1
	Ethers—acetic, butyric, sulphuric, &c.	36
	Ethyl bromide, chloride, iodide	12
	Chemicals, not enumerated	382
Miscellaneous ...	Confectionery containing spirit, brandy colouring, liquid fuel, catgut in alcohol, soluble glass, bilge water, &c.	122
	Total	25,731

Beer, although classed among the goods liable to spirit duty, is not dutied on the amount of spirit present, but on the "original gravity" or density of the words *before fermentation*. This necessitates, however, the determination of the amount of spirit present, from which the number of degrees of gravity lost by fermentation can be ascertained, and this added to the present gravity of the beer, gives the "original gravity."

Cider, although containing as much spirit as beer, is admitted free of duty, provided the customs officers have no reason to doubt the correctness of the entry as "cider." In doubtful cases samples are submitted to the laboratory for test and should there be evidence of the addition of spirit or of sugar (which, by fermentation is converted into spirit), the article is charged with duty as sweetened spirits.

It is necessary to ascertain and record the "obscuration" of enumerated spirits in cases in which, owing to the presence of sugar or other solid matter in solution the true strength cannot be directly determined by the hydrometer. In such cases the spirit is distilled and the difference between the *apparent* strength before and the *true* strength after distillation, or "obscuration" as it is termed, is recorded for subsequent use. When spirits are delivered for consumption after being in a bonded warehouse for a considerable time, perhaps years, it is only necessary to take the apparent strength by the hydrometer, and add to this the "obscuration," in order to arrive at the true strength. Otherwise to charge duty only on the strength recorded by the hydrometer would result in a serious loss to the revenue.

Spirit, even though denatured, is liable to duty on importation, but methyl alcohol and wood spirit are not charged unless purified so as to be potable, and therefore available as a substitute for ordinary spirit.

The steady decline noticed in recent years in the number of samples of wine tested still continues, there being a falling off of 1,071 samples at the central laboratory, and 3,783 at other testing stations in London, and at the outports, or a total decrease of 4,854 samples.

In nearly 500 instances the strength of the wine was found to be on the border line between the lower rate of 1*s.* 3*d.* per gallon for wines not exceeding 30° of proof spirit, and the higher rate of 3*s.* per gallon when the strength is over 30° but not exceeding 42°. In such cases careful retests are made to decide the rating.

Wine which becomes unsound whilst in Customs charge is delivered free of duty for conversion into vinegar after being denatured by the addition of a suitable amount of commercial vinegar or acetic acid. The quantity of acid necessary is determined in the laboratory, and 68 such samples were submitted during the past year.

Fusel oil usually contains a considerable proportion of dutiable spirit, which gives rise to a corresponding proportion of acetic ether (also dutiable) in amyl and butyl acetic made from such fusel oil. The spirit and acetic ether being regarded as accidental and unessential by-products are not charged with duty provided they do not exceed 15 per cent. in amount.

The remaining preparations containing spirit, consist for the most part of drugs, essential oils, flavouring essences, medicinal and toilet preparations, and perfumery. Chloroform, chloral hydrate, collodion, and various ethers being tariff articles are charged with duty without test except in doubtful cases. Hence the comparatively small number of samples of these chemicals.

Wrecked goods presumed to be of a dutiable character are submitted for test, and 11 such samples were examined during the year. They consisted generally of sulphuric ether, and included also spirit, acetic acid and guano.

TABLE 2.—Dry Goods.

DESCRIPTION.	NUMBER OF SAMPLES.
Coffee—for drawback	1,294
„ for colouring matter	12
Chicory and coffee substitutes	12
Chocolate and cocoa preparations and cocoa butter	70
Dandelion root	25
Tea—for home consumption	3,783
„ denatured and denaturants	856
„ preparations, including extracts	25
Tobacco—for moisture, sweetening matter, butting, &c. ...	594
„ offals for drawback	1,289
„ nicotine from	1,097
„ extracts	36
Miscellaneous—sheep dips, fumigating powder, medicinal cigarettes, &c.	289
Total	9,382

Coffee is charged duty on importation at the tariff rating, and samples are not necessary except in case of doubt as to correctness of entry. The 1,294 samples shown on Table 2 were submitted in connection with claims for rebate on coffee exported and used as ship stores. No drawback is allowed unless the coffee is free from adulteration. In four instances an admixture of chicory was discovered and drawback disallowed accordingly. This was found on investigation to be due to an accident in packing, &c., rather than intent to defraud.

Chicory, roasted or ground, is liable to the same import duty as coffee, and any other vegetable substance used as a coffee substitute is liable to the same duty when admixed with coffee. Such vegetable substance, if imported separately, is liable to excise, though not to a customs duty, unless falling into some other dutiable class as caramel (burnt sugar), roasted figs, &c.

Various vegetable substances allied botanically to chicory (as dandelion and burdock roots) are, on account of their similarity, submitted for examination, but being intended for use for medicinal purposes and not as a substitute for coffee or chicory, they are admitted free if found to be genuine.

A large increase is shown in the number of samples of tea examined under sect. 30 of the Sale of Food and Drugs Act, 1875, viz., 3,783 as compared with 2,205 in the preceding year. This is due chiefly to large importations of China tea of such a doubtful character that the local inspectors were not prepared to pass them without analysis, which was carried out at the central laboratory. In all, 479 samples of tea representing 2,070 packages were reported against, and of these, 27 samples representing 33 packages were found to be unfit for consumption as food.

The condemned tea is generally used for the extraction of thein or caffein (the alkaloid which gives to tea its stimulating properties), but is first denatured under the supervision of the customs officers. Samples of the denaturing agents and of the denatured tea after the operation are submitted to the laboratory to ensure that the regulations for protecting the revenue have been effectively complied with.

Over three thousand samples were examined in connection with the tobacco revenue. Unmanufactured tobacco normally contains more than 10 per cent. of moisture, and is not sampled for test unless the officers have reason to suspect that it has been dried below the 10 per cent. limit. If found to contain less than 10 per cent. of moisture, the tobacco becomes liable to an additional duty of 4*d.* per lb. as compared with the duty on tobacco containing 10 per cent. or more of moisture.

Samples of manufactured tobacco from factories in bond are tested to ascertain that they do not contain more than 32 per cent. of moisture, the maximum limit allowed by law for manufactured tobacco going into home consumption, and in the case of both manufactured and unmanufactured tobacco it is necessary to determine the exact percentage of moisture for the purpose of making up the periodical stock accounts of the officers supervising the tobacco factories.

Drawback is paid on waste or offal tobacco resulting from the manufacture of tobacco which has paid duty, provided the offal tobacco is found on examination in the laboratory to be genuine and unadulterated.

Much of this offal is used for the manufacture of *nicotine*, which is extensively used as the active ingredient of sheep dips, insecticides, &c. The nicotine is also tested to ensure that it is sufficiently pure to preclude its fraudulent use as tobacco extract.

Before delivery from Customs charge all offal tobacco must be denatured by the addition of suitable chemicals, &c., and samples of the denaturing agents, as well as of the denatured product after the operation is complete, are submitted in order to ensure that the revenue is adequately protected. Subject to similar safeguards tobacco extract (though formerly prohibited) is now permitted to be used for the manufacture of sheep dips and similar preparations,

thus encouraging the use of prepartions having nicotine as their active principle (in accordance with the recommendations of the Departmental Committee appointed by the Board of Agriculture to investigate the subject of the dipping and treatment of sheep) instead of the arsenical products formerly so much in vogue.

TABLE 3.—Saccharine Products (Imports).

Tariff Article.	Description.	Number of Samples.
Sugar	Imported sugar for polarisation	20
Composite goods containing sugar.	Angelica, fig confectionery, and imitation crystallised fruit.	266
	Biscuits, cakes, invalids' and infants' foods, &c.	322
	Desiccated cocoanut, tamarinds, dried herbs, &c. ...	50
	Catsup, chutney, meat extracts, pickles	250
	Confectionery, including liquorice, &c.	140
	Drugs, sugar-coated pills, and lozenges	769
	Fruit pulp, bottled fruit, jam, &c.	1,122
	Grape sugar, honey, invert, lactose, and manna, &c. ...	26
	Milk, condensed	53
	Milk powder and other milk preparations	353
	Miscellaneous (gelatine, glue, roller composition, parchment paper, &c.).	158
Molasses ...	Imported as molasses	813
	Miscellaneous preparations containing molasses :—(cattle foods, dyewoods, and tanning extracts, soy, &c.).	485
Glucose ...	Solid and liquid	37
Caramel ...	Solid and liquid	9
Saccharin ...	Containing saccharin or substances of a like nature ...	9
	Tested for saccharin and found free	808
	Miscellaneous	863
	Total	6,553

The small number of samples of imported sugar shown in the above table are only such as require special treatment in the laboratory. The ordinary samples for assessment of duty by a simple polariscope reading, which are tested locally by officers specially instructed for that purpose, numbered 23,422 (*see* Appendix C).

The number of samples of sugared products remains fairly constant as compared with last year, with the exception of tinned and bottled fruits which show a decrease of over one thousand samples. This is due to the fixed rates referred to in last year's report, as a consequence of which the great bulk of the tinned fruits are now admitted without sampling and testing each importation, this being an advantage to the merchant, as well as an economy in the cost of collecting the revenue.

Preparations containing appreciable quantities of saccharin are charged at the full rate of duty for saccharin, viz., £1 per pound. This high duty offers a strong inducement for the illegal introduction of saccharin without the payment of duty, and various ingenious devices have been resorted to for this purpose. It is also necessary to be on the look out for substances of a like nature or use to saccharin also for products closely allied to saccharin and requiring only a simple process for converting them into the finished dutiable article. Such cases are investigated and reported on as they arise. Of 817 samples tested for saccharin 808 were found to be free, and saccharin found in nine instances only. Several prosecutions for the illegal importation of saccharin have taken place during the past year, but in only one was the evidence of the laboratory officers required.

TABLE 4.—Saccharine Products (Exports).

DESCRIPTION.	NUMBER OF SAMPLES.
Sugar, for polariscope value	662
Aërated waters	93
Biscuits and cakes	208
Candied and drained peel	116
Caramel	38
Confectionery	1,488
Condensed milk	51
Dyewood extracts	21
Fruit syrups	118
Glucose	262
Invert and other brewing sugars	76
Jam, marmalade and jellies	547
Molasses and syrups	779
Saccharin	130
Miscellaneous	578
Total	5,167

Between three and four hundred firms claim drawback on sugar products, manufactured in the United Kingdom and Exported. Representative samples of each class of goods have been analysed and fixed rates of drawback sanctioned by your Lordships based upon the average percentage of sugar or other dutiable sweetening matter used in their manufacture, and the quantity of each class of goods exported.

An annual revision of these rates is made after examination of representative samples from the stock of each exporting firm. The number of such samples has increased from 3,839 in 1906–7 to 5,167 in the year under consideration.

TABLE 5.—Miscellaneous.

Tariff Article.	Description.	Number of Samples.
Sugar	Re-tests of samples from local stations	1,186
	Damaged sugar, sweepings, &c.	26
Syrups and Molasses	Re-test of samples from local testing stations	133
	Refinery products	1,559
Spirits	Re-tests from outports	397
Merchandise Marks Act.	... ...	2
	Total	3,303

As in the case of spirit testing, it has been found convenient to establish testing stations at the various outports for the assessment of duty on sugar and sugar products. The work is performed by Customs Officers specially instructed for the purpose, and the accuracy of their work is checked by periodical re-tests in the central laboratory as well as by a re-test of samples which fall on the boarder line between two different ratings for duty. The results prove that the testing work of the local testing officers is performed in a most efficient manner.

During the year under review, nine officers have been sent to the Laboratory for a course of instruction in testing work with a view to qualifying as Tea Inspectors (after approval by your Lordships) under Section 30 of the Sale of Food and Drugs Act, 1875. Of these, seven were stationed in London, one at Leith, and one at Belfast.

Prosecutions at which the attendance of analysts in the Customs Branch has been required to give evidence, have taken place at South Shields and London for the illegal sale of cavendish tobacco without the revenue stamp, and one in London connected with the smuggling of saccharin.

Convictions were obtained in the first two cases, and in the last, the defendant failed to appear.

TABLE 6.—Hydrometers and Gauging Instruments.

	NUMBER.
Hydrometers	544
Thermometers	361
Graduated apparatus, specific gravity bottles, &c.	1,734
Total	2,639

Hydrometers and thermometers for ascertaining the strength of spirits, and standardised flasks for use at the Testing Stations, as well as all gauging instruments required by Customs Officers throughout the United Kingdom, are issued from the Laboratory after being verified as to their correctness. During the past year 2,639 instruments requiring such verification have been issued in addition to other apparatus of a technical nature.

TABLE 7.—Summary of tests made in the Customs Branch of the Government Laboratory during the year ended 31st March, 1908.

TABLE NO. AND DESCRIPTION.	NUMBER.
1.—Goods tested for liability to spirit duty	25,731
2.—Dry goods, coffee, tea, tobacco, &c.	9,382
3.—Sugar products (imports)	6,553
4.—Sugar products (exports)	5,167
5.—Miscellaneous samples	3,303
6.—Hydrometer and other gauging instruments	2,639
Total	52,775

The following table shows the kind and number of samples tested at the local stations in London and at the outports, viz. :—Liverpool, Glasgow, Dublin, Belfast, Bristol, Cardiff, Cork, Folkestone, Greenock, Harwich, Hull, Leith, Manchester, Newhaven, and Southampton. Details of the work done at each of these testing stations are shown in Appendix C.

TABLE 8.—Samples tested at other London Stations and at the Outports :—

ARTICLES.	NUMBER OF SAMPLES.
Beer	4,053
Cider and perry	214
Spirits, for obscuration, brandy, Geneva, and rum	20,179
,, compounds, liqueurs, &c.	4,228
Wines	80,119
Sugar for polarisation—imports	12,778
,, ,, ,, exports	2,040
,, ,, ,, refinery...	8,604
Molasses—imports	1,017
,, exports	626
,, refinery	1,478
Miscellaneous, spirit preparations, &c.	2,808
Total	138,144

A considerable number of samples connected chiefly with claims for drawback on manufactured tobacco and commercial snuff on exportation, and tobacco offal are examined for the Board of Customs in the Inland Revenue Branch of the Government Laboratory and are referred to later under "Tobacco." The number of such samples and of samples of imported dairy produce examined for the Board of Agriculture and Fisheries during the past year was 59,262, so that

the total number of tests made in the Government Laboratories and at Testing Stations in connection with the Customs Department during the financial year ended 31st March, 1908, was 250,181.

I. (B)—EXCISE.

The number of analyses and examinations made in the Inland Revenue branch of the Government Laboratory at Clement's Inn Passage during the year ended 31st March, 1908, was 138,259, against 121,318 in the preceding year.

This increase of over 17,000 is due mainly, as in the case of the increase last year, to the large number of samples of offal tobacco, &c., taken in accordance with the regulations under which such tobacco is presented for drawback, and also to the larger number of samples of medicinal tinctures exported on drawback.

Worts and Brewing Materials.

The work under this head refers to the examination of samples taken in connection with the duty on beer.

The basis of charge, upon which the beer duty is raised, is a declaration made by the brewer, and in order to check this declaration, as regards the gravity, samples of wort in various stages of fermentation are taken at uncertain intervals from breweries throughout the United Kingdom by the Surveying Officers.

5,455 of such samples have been analysed during the past year at the Government Laboratory, and 2,760 at the local chemical stations (see Appendix B).

The original gravity was found to have been under-declared in 1,218 cases, viz. :—

1,196	under-declared	1	degree,	but less than	5.
14	„	5	degrees	„ „ „	10.
8	„	10	„	and upwards.	

The percentage of samples in which the charge was raised on analysis was 14·8, against 12·0 last year.

In addition to the samples of wort examined for original gravity, 458 samples of malt, sugar, maize, rice, and other brewing materials have been examined to determine their wort-producing value, and to check the statement of the brewer as to the quantities used in the various brewings. 36 samples of wort were analysed to determine whether sugar had been used without entry, and 210 samples of yeast foods, beer preservatives, &c., were analysed in order to determine whether their use could be permitted.

Beers.

Beers exported on drawback.—From the beer exported from this country on drawback 7,802 samples, representing 222,510 barrels, were examined at the Government Laboratory, and 6,907 samples, representing 225,526 barrels, at the local chemical stations. Of the total, 112 samples, representing 6,409 barrels, were found not to agree with the declaration of the Exporter and the consignment was therefore not entitled to the drawback claimed. The percentage of samples so disqualified was 0·8 per cent. which is practically the same as last year.

Beers from publicans.—The sampling of beer in the condition in which it is sold to the public for the purpose of testing for dilution and adulteration has been continued. 6,112 samples taken from 2,237 publicans, and of these samples 741, or 12.1 per cent. were found to have been diluted, being nearly 2 per cent. more than last year. In addition to, and in connection with the above 739 samples, representing the beer as supplied to the retailer, were received from the respective breweries.

169 samples of finished beer and 46 samples of sugar solutions used as "priming," were examined for the presence of saccharin. There was no evidence of its use.

19 samples of finished beer were examined for the presence of saponin, but in no case was the prohibited ingredient found.

Herb beers and other beverages sold as temperance drinks.—Under this heading are included samples known as ginger beer, herb beer, horehound beer, sarsaparilla beer, nettle beer, barm beer, hop ale, burdock, and dandelion stout, &c., such liquids not being liable to revenue restrictions unless they contain more than 2 per cent. of proof spirit.

1,106 samples were examined, and of these—

89 contained 3 per cent. but less than 4 per cent. of proof spirit.
32 „ 4 „ „ „ „ 6 „ „
6 „ 6 „ or more; of these, two samples (described as "herb beer" contained respectively 8·3 per cent. and 8·5 per cent. of proof spirit.

194 samples of beer which brewers found unfit for consumption after the manufacturing process had been practically completed, and which they desired to destroy, were also examined in order to determine whether the duty charged could be remitted.

Arsenic.—1,011 samples of beer, wort, and materials used by brewers have been tested for the presence of arsenic. Of these, 48 were found to contain it in excess of the limits laid down by the Royal Commission on Arsenical Poisoning, namely, the equivalent of one-hundreth of a grain of arsenious oxide per pound in the case of solids, or per gallon in the case of liquids.

Of the 121 samples of malt examined, nine exceeded the limit, the highest amount found being one-twentieth of a grain per pound. Of 617 samples of glucose, invert sugar, caramel, &c., none exceeded the limit. The greatest amount found in any sample of wort or beer was one-twentieth of a grain per gallon. The greatest amount found in any sample examined was one-tenth of a grain per pound, this quantity being present in an article intended for flavouring stout.

In addition to the above, 317 samples of mineral acids, chemicals, drugs, vinegar, &c., were also tested for this impurity.

Spirits.

Medicinal tinctures, &c.—The number of samples examined during the year was 16,808, compared with 14,302 examined the previous year. These samples represented tinctures, liniments, extracts, infusions, medicinal spirits, flavouring essences, hair washes, brilliantines, dentifrices, &c., presented for drawback and examined as a check upon the claim of the exporter.

The proof gallons of spirit exported under the Tincture Regulations in the year ended 31st March, 1908, amounted to 152,268 against 135,771 in the previous year.

The considerable increase in the number of samples examined this year is due in part to the larger number of samples of those preparations which are allowed to be prepared in this country from industrial methylated spirit, each consignment of these articles presented for drawback being examined as to freedom from methylated spirit. This action has been found necessary in order to prevent the substitution of articles prepared from methylated spirit for those prepared from duty paid spirit.

British compounds, &c., for dutiable value.—3,973 samples of compounded spirits, liqueurs, and wines were tested for their spirit value and character, and in the case of 1,898 samples the sugar present was estimated in order to check the exporter's claim for drawback.

214 samples of brandy and rum have been examined in order to ascertain how far their alcoholic strength as determined in the ordinary way by Sikes' Hydrometer was obscured by the sweetening and colouring matters present.

Denatured and Duty-Free Spirit for Manufacturing Purposes.

Methylated spirits.—782 samples of wood naphtha, representing 291,895 gallons, submitted for approval for methylating purposes were examined. Eleven samples, representing 2,864 gallons, could not be approved.

Number of Samples and Quantities of Wood Naphtha approved and rejected in the years ended 31st March, 1906, 1907, and 1908.

	1908.	1907.	1906.
Number of samples approved	771	822	929
„ „ rejected	11	5	6
Gallons approved	289,031	337,216	382,110
„ rejected	2,864	1,617	2,423

The number of samples rejected is somewhat greater than last year, but the quantity represented by these samples is small, being less than one per cent. of the quantity presented for approval.

There is again a marked decrease in the quantity of wood naphtha used for methylating purposes. This decrease does not, however, mean that there has been any diminution in the quantity of methylated spirits used in manufacturing operations, but is entirely due to the provisions of the Revenue Act of 1906, which authorised the Commissioners of Inland Revenue to allow the alcohol intended for use in arts and manufactures, and now called *industrial methylated spirits*, to be denatured with five per cent. of wood naphtha instead of the 10 per cent. formerly required to be added to the *ordinary unmineralized methylated spirit* used for manufacturing purposes.

The quantity approved during the year has, however, been sufficient to allow of a very considerable increase in the total quantity of methylated spirits made during the year as compared with either of the two preceeding years.

Quantities of Methylated Spirits made during the years ended 31st March, 1906, 1907, and 1908.

	1908.	1907.	1906.
	Bulk Gallons.	Bulk Gallons.	Bulk Gallons.
Ordinary and industrial methylated spirit for manufacturing purposes.	2,589,500	2,445,600	2,139,000
Mineralized methylated spirit, mainly for domestic use.	1,583,900	1,590,000	1,688,000
Total of both kinds ...	4,173,400	4,035,600	3,827,000

This shows an increase last year of 143,900 gallons in the industrial or manufacturing spirit over 1907, and 416,700 gallons over 1906. The mineralized methylated spirit made in 1908 is about the same as last year, and is still less than in 1906. The net increase in both kinds of methylated spirit made in 1908 as compared with 1907 is 137,800 gallons.

During the year ended 31st March last, 715 applications connected with the use of methylated spirit have been referred to this department for report, making a total of 1,349 since the introduction of industrial methylated spirit in October, 1906.

From this, and from other information coming before me, I have every reason to believe that the advantages of the new industrial methylated spirit

are fully appreciated by manufacturers, and that the decrease in price, as well as the greater purity of this alcohol in consequence of the new regulations will lead to its increasing employment in industrial operations.

The new regulations with reference to the use of industrial methylated spirit appear to be generally accepted as satisfactory by manufacturers who use this spirit.

One hundred and eighty-nine samples of mineral naphtha, representing 6,047 gallons, were examined, and all were approved as suitable for methylating purposes.

Eighty-five samples of "petroleum ether," representing 2,631 gallons, were also examined, and all, excepting one sample representing 35 gallons, were approved. This "petroleum ether" is added to the industrial methylated spirit used in certain manufacturing operations as an additional safeguard against the misuse of the spirit.

A return (*see* Appendix D) has been prepared from information supplied by manufacturers and other users showing the quantities of industrial methylated spirit used in the principal manufacturing operations and for other purposes during the year under review.

As mentioned in my last report it may be observed that the quantity of industrial methylated spirit issued to manufacturers does not fully represent the quantity of such spirit actually used in manufacturing operations.

In many cases this spirit is only used as a temporary solvent for one or more of the substances employed in the manufacturing operations, or for crystallizing and purifying purposes. In such cases the Commissioners of Inland Revenue permit the spirit so used to be recovered by distillation, and spirit thus recovered is used again in similar operations. Very compact and efficient apparatus for recovering the spirit has come into use in recent years, and in some cases 90 per cent. or more of the spirit used in an operation is recovered and used again. In such cases the quantity of fresh industrial methylated spirit bought by a manufacturer represents the waste or loss only, and not the quantity of spirit employed in his operations.

The greater efficiency in the recovery plant in recent years thus tends to somewhat mask the actual increase which has occurred in the use of methylated spirit for manufacturing purposes.

Duty-free spirit under the Finance Act, 1902.—The use of pure duty-free spirit (undenatured ethyl and methyl alcohols) in the science laboratories of universities, colleges, &c., again shows an increase compared with previous years. The quantity issued to these institutions during the year ended 31st March last was 4,323 proof gallons, against 4,017 in 1907 and 3,314 in 1906.

There has also been a substantial increase in the quantity of specially denatured alcohol used for manufacturing purposes. Alcohol equivalent to 473,509 proof gallons was issued to manufacturers in the year ending 31st March last, as compared with 431,898 in 1907 and 351,615 in 1906.

The following table gives the quantities of British and Foreign Spirits issued duty free under the provisions of the Finance Act, 1902, for the years ending 31st March, 1907 and 1908 :—

—	1908.			1907.		
	Proof Gallons.			Proof Gallons.		
	British.	Foreign.	Total.	British.	Foreign.	Total.
Universities, colleges, &c.	930	3,393	4,323	1,221	2,796	4,017
Manufacturers ...	467,758	5,751	473,509	431,189	709	431,898
Total ...	468,688	9,144	477,832	432,410	3,505	435,915

The total quantity of duty-free spirit expressed in proof gallons used for all purposes, domestic and manufacturing, during the years ended 31st March, 1907 and 1908, was as follows :—

	1908.	1907.
	Proof Gallons.	Proof Gallons.
In *mineralized* methylated spirit for domestic use	2,339,782	2,338,000
In industrial methylated spirit for manufacturing	4,115,593	3,717,000
In spirit otherwise denatured—manufacturing ...	473,509	432,000
Used in universities, colleges, &c.	4,323	4,000
Total	6,933,207	6,491,000

The total quantity of foreign spirit used for manufacturing purposes, &c., during the year ended 31st March, 1908, including pure absolute alcohol and methyl alcohol, was equivalent to 13,500 proof gallons or about 6,500 bulk gallons.

For purposes of controlling the use of methylated spirit a large number of samples have been examined. They include spirits, both methylated and duty-paid, recovered in various manufacturing operations, denaturing-agents, such as petroleum ether, aniline, and bone oil ; also preparations for medicinal, toilet, or flavouring uses in which alcohol is employed. Two cases of illegal traffic in industrial methylated spirit by manufacturers authorised to use this form of alcohol were discovered. In each instance the offenders were proceeded against, and substantial penalties were imposed.

Forty-six samples of methylated spirits and " finish " were examined in connection either with the sale of methylated spirit by unlicensed vendors, or with a view of determining whether the spirit was such as could be legally retailed. In 15 instances of unlicensed sale the samples were found to be either methylated spirit or " finish " containing less than the legal proportion of gum resin. Neither article could legally be sold without licence, and proceedings were therefore initiated against, or cautions issued to, the vendors of the spirit.

Miscellaneous spirits and spirituous liquors.—Sixty samples of spirits supposed to have been obtained by " grogging " spirit casks were examined during the year. In some cases the intention to " grog " was obvious, and in one instance a penalty of £100 was inflicted. Many of the samples, however, were evidently the result of carelessness rather than of attempts to extract spirit illegally.

In connection with a case of illicit distillation on a somewhat extensive scale forty samples were examined. They comprised chiefly wine, spirits, syrups, colouring and flavouring materials as well as various cordials in process of manufacture. The *modus operandi* has apparently consisted in distilling cheap wines and flavouring the resulting spirits to represent " Cognac Vieux," Maraschino, Chartreuse, and other well-known liqueurs. The defendants were convicted, and fines amounting to £235 imposed.

Nineteen samples of articles described by such names as " cordials," " liqueurs," " peppermint," and " ginger brandy " were analysed in order to ascertain whether they came within the definition of compounded spirits. In several instances they were found to be such spirits, and penalties were imposed or the proper licence duty exacted. Out of 20 samples of " liqueur chocolates " examined, 11 were practically free from spirit, and only 5 contained any notable quantity of alcohol.

Twenty-three samples of fusel oil from distilleries were analysed during the year. In three cases the oil contained an excessive quantity of ethyl alcohol, and could not be allowed to leave the distillery duty-free ; all the other samples were found to be in accordance with the regulations.

Seventy-three samples of spirits exported on drawback were specially examined in order to determine whether they were so distinctly altered in character as to entitle them to be classed as compounded spirit.

Tobacco.

In the Tobacco Department at Clement's Inn Laboratory work is performed for both Revenue Boards.

For the Board of Customs, samples are examined of—

1. Manufactured tobacco, and commercial snuff exported on drawback.
2. Offal tobacco—shorts, smalls, snuff, and stalks of tobacco, deposited on drawback for denaturing, abandonment, or for exportation.
3. Original leaf and stalks, import tobacco for rating.

For the Board of Inland Revenue, samples are examined of—

4. Manufactured tobacco for controlling the amounts of moisture and oil.
5. Tobacco and snuff for adulteration, tobacco from Cavendish factories or Excise Warehouses for moisture, and miscellaneous articles cognate to tobacco and its manufacture.

1. *Manufactured tobacco and commercial snuff examined for drawback under the standing regulations.*—The following table shows the number of samples and the weight of manufactured tobacco and of commercial snuff exported as merchandise, or deposited in warehouse, or forwarded direct to ships as ships' stores, analysed during the year ended 31st March, 1908.

Manufactured Tobacco and Commercial Snuff.

Description.	Number of Samples.	Pounds weight.
Tobacco—		
Cut	1,397	136,485
Roll	159	35,164
Cake and plug	14	1,097
Cigars	486	17,463
Cigarettes	5,189	408,376
Snuff—		
Rappee	87	2,451
Scotch	97	7,895
Total	7,429	608,931

The total number of samples analysed was approximately the same as in the previous year. As regards weight there were increases of 28,874 pounds of cut tobacco and of 22,572 pounds of roll tobacco, but a decrease of 172,452 pounds of cigarettes exported as compared with the weights exported during the year ended 31st March, 1907.

2. *Offal tobacco, shorts, smalls, snuff and stalks examined for drawback under the standing regulations during the year ended 31st March*, 1908.—The regulations under which offal tobacco is presented for repayment of duty have again worked satisfactorily.

They are based on the provisions of the Finance Act, 1904, and manufacturers are permitted to present their refuse of tobacco either for abandonment or for denaturing, or for exportation on drawback in various forms, viz. :—

1. "Stalks," that is to say, the midrib of tobacco leaves.
2. "Shorts" or "smalls."
3. "Snuff."

Some of the snuff had been ground from tobacco, but large quantities are only technically snuff, being merely the siftings of tobacco of such fineness as to pass through the meshes of the official standard sieve.

In addition to the samples of tobacco stalks drawn expressly for the purpose of assessing the amount of drawback, additional or preliminary samples are drawn, concurrently therewith, in order to ascertain whether the

stalks deposited are sufficiently uniform in condition as regards moisture to ensure that the drawback samples from the same deposit may be accepted as being fair alike to the manufacturer and the Revenue.

The following table shows the number of samples taken from refuse tobacco deposited on drawback for denaturing, abandonment, or for exportation, and examined during the year :—

Kind.	Number.
For drawback—	
Tobacco, shorts and smalls	1,358
Snuff, offal	1,130
Tobacco stalks	10,567
For preliminary test—	
Tobacco stalks	35,873
Total	48,928

Compared with the number of samples dealt with under these heads in the year ended 31st March, 1907, this total shows an increase of 13,737 samples.

Of the foregoing samples, 162 of the samples of manufactured tobacco and 95 of the samples of offal tobacco were also tested for the amount of added oil they contained, which by the Oil in Tobacco Act, 1900 (63 & 64 Vict. c. 35), is restricted to 4 per cent. With the exception of a sample of offal snuff, all the samples in question were found to contain oil within the legal limit.

3. *Other samples examined for the Board of Customs :—*

Kind.	Number.
Original leaf, and stalks	882
Import tobacco for ascertaining rate of duty ...	23
Miscellaneous	8
	913

The samples of original leaf and stalks were taken from the stocks of various manufacturers in connection with tobacco—manufactured and offal—found to contain inorganic matter or sand beyond the limits laid down in Act 26 Vict. c. 7 and the Finance Act of 1904. These samples are taken and examined to assist the Board of Customs in exercising the discretion conferred upon them by Section 6 of the Act 59 & 60 Vict., c. 28 as to the payment of drawback on such tobacco.

Of the samples examined for rate of duty, one was found to be free from tobacco, two could not be legally imported, eight were required to be entered as "cavendish," and the remainder as "tobacco and cigarettes, other sorts."

Total number of samples examined for the Board of Customs :—

	Year ended 31st March. 1907.	1906.
Manufactured tobacco and snuff ...	7,429	7,391
Offal tobacco and snuff	49,928	35,191
Leaf, import tobacco, &c.	913	682
Total	57,270	43,264

4. *Examination of manufactured tobacco for moisture and oil.*—By the Customs and Inland Revenue Act, 1887 (50 & 51 Vict., c. 15, s. 4), as amended by the Finance Act, 1904, the amount of moisture which may be present in manufactured tobacco is restricted to 32 per cent. By the Oil in Tobacco Act, 1900 (63 & 64 Vict., c. 35), the amount of oil is restricted to 4 per cent.

For controlling the amounts of moisture and oil under these Acts—10,517 "general" samples, and 1,000 "special" samples from the premises of manufacturers, and 540 "special" samples from the stocks of dealers, were examined at the Government Laboratory, and 6,625 "general" samples by the laboratory officers at the local chemical stations, for their moisture content.

Of these samples 4,240 were also examined either at the Government Laboratory, Clement's Inn Passage, or at the chemical stations, for the amount of oil they contained.

As regards excess of moisture; in 104 cases the attention of the manufacturer or dealer was called to the fact that the tobacco did not strictly comply with the requirements of the law, and in 21 instances when the excess of moisture was not large the trader was warned by the proper supervisor. Ten traders were cautioned by the Board of Inland Revenue, and in 51 cases penalties were recovered.

As regards tobacco found to contain excess of oil; in nine cases the trader was informed that the tobacco contained oil slightly in excess of the legal limit. Two traders were warned by the supervisor of the district, and three were cautioned by the Board of Inland Revenue. In nine cases penalties were imposed.

5. *Tobacco in which adulteration was suspected*—

Found to contain liquorice	7
„ „ glycerine	1
„ be genuine	3
Tobacco for moisture—	
From Cavendish factories...	32
„ Excise warehouses	21
Snuff (*Commercial*)—	
Genuine	103
Illegal	5
Miscellaneous	72
Total	244

The samples of tobacco found to contain liquorice or glycerine, were cake or cut cavendish, being exposed for sale by persons duly licensed as tobacco dealers. The tobacco had been in some cases apparently smuggled, but in others the Customs label, which should be intact when the package is sold, had either been removed or broken by the retailer. The offenders were either cautioned or fined.

Eleven of the samples of commercial snuff found to be genuine in that they were free from ingredients specifically prohibited by law, and that the amounts of legal ingredients were within the limits laid down by law, contained, nevertheless, excessive amounts of tobacco sand. Five of the samples of commercial snuff were found to contain percentages of alkaline salts in excess of that allowed by law.

Miscellaneous.—Numerous samples of a general nature not included in the foregoing branches of work or shown separately in Appendix A, were analysed in connection mainly with questions relating to the evasion of, or liability to, various licence duties. They comprised pills, powders, and other medicinal preparations for examination as regards their liability to Medicine Stamp Duty; Postage and Revenue stamps alleged to have been used illegally, and similar stamps for examination in respect of the character of the pigment employed; coffee mixtures and coffee substitutes; a large number of medicated wines—for the determination of their liability to licence duty; saccharin and saccharin compounds in connection with Revenue control of the manufacture of saccharin, or with the illegal possession of that article; silver articles, the vendors of which were alleged to be chargeable with plate licence duty; and miscellaneous articles such as amyl acetate, butyric ferment, saccharinated wood, acetic acid and vinegar, forwarded in connection with various Revenue questions.

Hydrometers, &c.—Hydrometers and thermometers for ascertaining the strength of spirits, together with graduated vessels for use in warehouses, are issued from the Laboratory after being verified as to their correctness. Saccharometers are similarly examined, also flasks and other apparatus of a technical character. During the past year 853 hydrometers and 1,107 saccharometers, together with 983 thermometers for use with the same, and 495 graduated glasses, flasks, &c., have been examined.

Twenty-four supervisors of Inland Revenue, before taking charge of their districts, have received one month's instruction in the methods of detecting common forms of adulteration and in otherwise protecting the Revenue from fraud.

Legal proceedings.—In 28 of the cases of legal proceedings taken in respect of Revenue samples analysed in this department the analysts attended Court to give evidence, and penalties amounting in the aggregate to £1,157 were imposed; most of the other cases were settled out of Court, and the fines amounted to £3,363.

The offences may be summarised as follows:—

	Cases.
For diluting or adulterating beer	151
For selling so-called temperance drinks containing excess of alcohol.	30
For grogging spirit casks	19
For illicit distillation	3
For excess of moisture or oil in tobacco	54
For possession of illicit saccharin	5
For evasion of sundry licence duties	35
Miscellaneous	30
Total	327

II.—OTHER GOVERNMENT DEPARTMENTS.

The following table shows the departments, other than the Customs and Inland Revenue, from which samples have been received during the year ended 31st March, 1908:—

Department.	Number of Samples.
Admiralty	277
Board of Agriculture and Fisheries	2,303*
Board of Trade	442
Colonial Office	5
Commissioners of Works, London...	374
Commissioners of Works, Dublin	9
Home Office	230
India Office	1,523
Local Government Board	1,200
Post Office	168
Stationery Office	8
Trinity House	165
War Office	422

Admiralty.—The samples examined for the Admiralty consisted principally of food substances, and included 94 samples of condensed milk, 59 samples of butter, 37 of vinegar, 21 jams, 14 samples of beer, 11 of suet and lard, 9 of mustard and pepper, and 5 of lime and lemon juice.

Among other samples examined for this department were a number of samples of guano which had been brought from one of the dependencies of the Crown with a view to the determination of their commercial value. Analyses were also made of three samples of ebonite received from the Contract Department.

* Includes 1,992 samples of imported butter, &c. taken at the ports by Customs Officers.

Board of Agriculture and Fisheries.—In connection with the Board of Agriculture and Fisheries, 2,303 samples have been examined in the year ended 31st March, 1908, as compared with 2,429 samples in the previous year.

	1907–8.	1906–7.
Imported butter	1,486	1,842
,, margarine	200	42
,, cheese	66	87
,, milk (fresh and sterilised)	46	29
,, ,, (condensed)	133	117
,, cream	61	67
Samples taken under the Butter and Margarine Act	73	—
Sheep-dips	168	152
Miscellaneous	70	93
	2,303	2,429

The samples of imported dairy produce and margarine were taken at the various ports by the officers of the Board of Customs in accordance with the provisions of the Sale of Food and Drugs Act, 1899, and the Butter and Margarine Act, 1907.

Butter.—The following table gives particulars of the examination of the samples of imported butter :—

Country from which Imported.	Total Samples.	Containing Boron Preservative.		Containing added Colouring Matter.	
		Number.	Percentage.	Number.	Percentage.
Holland	382	194	50·8	149	39·0
Denmark	353	—	—	70	19·8
New Zealand	140	115	82·1	2	1·4
France	139	127	91·4	28	20·1
Russia	138	5	3·6	24	17·4
Australia	113	105	92·9	9	8·0
Belgium	89	76	67·8	31	34·8
Norway	34	—	—	1	2·9
Sweden	33	—	—	9	27·3
Canada	25	9	36·0	2	8·0
United States	19	2	10·5	5	26·3
South America	18	17	94·4	—	—
Germany	2	—	—	1	50·0
Iceland	—	—	—	—	—
Totals	1,486	650	43·7	331	22·3
Totals 1906–7	1,842	818	44·4	463	25·1

Of the samples of butter imported from—

Belgium	56 were described as	Italian.
Denmark ...	61 ,, ,,	Swedish.
,, ...	12 ,, ,,	Russian.
,, ...	12 ,, ,,	Siberian.
Russia	11 ,, ,,	Siberian.

The reduction in the number of samples of imported butter taken during the year arises from the circumstance that the importation of butter from places known to be concerned in the sophistication of butter has largely diminished owing doubtless to the influence of the prosecutions undertaken by the Commissioners of Customs in the previous two years. Importers in this country

are exercising care to obtain butter from sources that can be relied upon, since the onus of defending a prosecution falls on the importer and not on the foreign exporter.

No sample has afforded conclusive evidence of adulteration with foreign fat, and in only a few cases has the butter been of suspicious character. In fact, butter of the character of the samples concerning the importation of which legal proceedings were taken during the years 1905 and 1906 has entirely disappeared from the importations of the past year.

There has, at the same time, been a reduction in the number of samples found to contain water in excess of the legal limit. In the present year this number is 16, as against 30 in 1906–7. All the cases were reported to the Commissioners of Customs, and in every instance in which proceedings were taken convictions have been obtained.

I may mention, however, that certain Colonial butter which has for years had the reputation of being "dry" butter, and as such was peculiarly useful to the fraudulent trader, shows a marked tendency to an increase in the amount of water, the average percentage of water in the samples taken during the last three months of this particular butter being 13·0, as against 10 or 11 per cent. two or three years ago.

The proportion of samples containing boron preservative remains practically the same as in the previous year. As regards the quantity of boric acid present, this frequently exceeded the limit recommended by the Committee on Preservatives in Food, but for the reasons given in my last Report I have been unable to advise that proceedings should be taken.

There has been a further diminution in the number of samples which have been artificially coloured—from 25·1 per cent. in 1906–7 to 22·3 per cent. in the present year.

No samples of imported milk-blended butter have been received, six samples of butter, entered as "milk-blended," were taken, the erroneous entry arising either from ignorance or from the desire to cover the presence of water in excess of the limit for butter of 16 per cent. by taking advantage of the higher limit of 24 per cent. for milk-blended butter.

Margarine.—The increase in the number of samples of margarine has been brought about by the operation of the Butter and Margarine Act, 1907, which came into force on January 1st, 1908, and which makes it an offence to import margarine containing more than 16 per cent. of water or 10 per cent. of butter fat. Of the 200 samples received, 178 were examined as to contravention of the Act upon these two points. None of the samples was found to contain an excess of butter fat, but four exceeded the legal limit for water, and reports upon these were made to the Commissioners of Customs who caused proceedings to be taken against the importers. Of the 178 samples, 155 were from Holland, 6 from France, 6 from the United States, 4 from Norway, 3 from Belgium, 3 from Denmark, and 1 from Canada.

In addition to these, 22 other samples of imported material to be used as butter substitutes or in the manufacture of margarine were submitted by officers of Customs to ascertain whether the material so closely resembled butter as to be legal margarine. As regards 19 of the samples, I was unable to certify that the article should be marked "Margarine," but three cases were reported to the Commissioners of Customs, who caused proceedings to be taken against the importers in regard to 2 of the samples.

Cheese.—The 66 samples of cheese examined were taken from consignments arriving from the following countries:—Canada, 26; Holland, 20; United States, 8; New Zealand, 5; Belgium, 3; France, 3; Germany, 1. Four of the samples from the United States were described as Canadian produce.

One sample was found to be margarine cheese, and not being marked as required by the Act, legal proceedings were instituted by the Commissioners of Customs and a conviction obtained. As in previous years, the marks upon the packages in no way indicated the fact that many of the samples had been prepared from skimmed milk, but in the absence of any regulation on the point, no action could be taken by the Customs authorities.

Milk and Cream.—The following are the particulars relating to the samples of milk and cream examined :—

Country whence Imported.	Milk.				Cream.
	Condensed.		Not Condensed.		
	Sweetened.	Unsweetened.	Fresh.	Sterilised.	
Belgium	5	4	—	6	2
Denmark	1	—	—	—	—
France	23	4	31	—	52
Germany	—	6	—	1	1
Holland	49	9	—	3	1
New Zealand	2	2	—	—	—
Norway	7	21	—	5	5
Totals	87	46	31	15	61
	133		46		
Totals 1906–7	66	51	18	11	67
	117		29		

Eighteen samples of condensed milk from France, five from Holland, and three from Belgium were described as Swiss produce.

Twelve of the samples classed as condensed milk were "milk powder" or "dried milk," and two samples entered as "milk powder" consisted of milk proteins only.

Eight samples of ordinary condensed milk and four samples of "milk powder" were found to have been prepared from skimmed milk, and were reported to the Commissioners of Customs. As the packages containing these goods were not marked "skimmed milk" as required by the Act, and in no way indicated that the condensed milk had been prepared from skimmed or separated milk, proceedings were taken against the importers.

The increase in the number of samples of fresh milk arose from the circumstance that owing to a shortage in the milk supply in this country regular consignments arrived at Southampton from France at intervals of a few days during February and March. In no case was the milk below the minimal limits fixed by the Sale of Milk Regulations, 1901, and preservatives were absent.

Of the 61 samples of cream, 45 contained boron preservative, 36 of these containing in addition salicylic acid. As a result of the proceedings taken in the Courts by some local authorities, the proportion of boric acid in the samples of imported cream at once fell below the amount suggested as a limit by the Committee on Preservatives in Food, and in the later samples both boric and salicylic acids have been absent. In several of the most recent samples, the preservative employed has been "hydroxyl."

There is no standard as to the amount of milk-fat that must be present in cream, and consequently the proportion of fat varies considerably. In the imported samples examined during the year, the range of fat was from 24 to 50 per cent., which must represent a considerable difference in value.

Three samples were taken from goods imported in tins labelled with the words "Evaporated Cream." To an ordinary observer, this description would suggest an article even richer than cream, but in reality the samples consisted of unsweetened milk condensed about two and a half times, and were therefore somewhat less concentrated than the best brands of condensed milk. The words "Evaporated Cream" appeared conspicuously and repeatedly upon the label, and it was only in the small descriptive type that it was stated that evaporated cream was "milk from cows, evaporated to the consistency of cream." I reported the circumstances of these importations to the Commissioners of

Customs, who, after consultation with the Board of Agriculture and Fisheries, decided that no action could be taken.

Samples taken under the Butter and Margarine Act.—In pursuance of the extended powers granted under the Butter and Margarine Act, 1907, the Inspectors of the Board of Agriculture and Fisheries, who hitherto could only enter registered margarine factories, have now authority to enter all premises where butter is blended or re-worked, or where milk-blended butter is manufactured, and to take samples of materials found on the premises. The examination of these samples is carried out here, and I have received in the two months during which this systematic inspection has been in force, 51 samples of butter, two of milk-blended butter, and 15 of margarine. In a number of cases the proportion of water in the samples has exceeded the legal limit, but with one exception no material of suspicious character has been received. This exception was in regard to five samples taken from the premises of a provision dealer who was suspected of mixing butter and margarine. No blending machine was found on the premises but two of the samples were illegal mixtures.

Sheep-dips.—The samples of sheep-dips were submitted to the Board of Agriculture and Fisheries by makers who made application for the inclusion of the dip in the official "Schedule of efficient dips." A large number of the samples consisted of "home-made" dips, generally made by farmers or sheep-dippers, which, although not for sale, required the Board's approval under the Sheep Scab Orders.

Of the 168 dips analysed, 109 agreed with the makers' formulæ and were of effective strengths, 34 were deficient in active ingredients, and in the remaining 25 cases the samples were so different from the formulæ submitted by the makers that the dips could not be regarded as proper samples. Six of the samples were analysed for the Department of Agriculture and Technical Instruction, Ireland, as against four for that Department in 1906-7.

Besides the dips examined, 83 applications for approval were received, 17 of which were for dips at strengths different from those which had already been approved, and 66 for dips which were insufficiently described or which would produce ineffective dipping baths.

Miscellaneous.—These samples consisted of butter, butter adulterants, cider, preservatives, fertilisers, river and outfall waters, and dead fish from polluted rivers.

Among other questions dealt with for this Department was one connected with the contamination of a tributary of the River Coquet in Northumberland. This stream received the water pumped from a colliery on its banks, and it was observed that the water contained a large amount of suspended matter. On one occasion 13 dead salmon were found floating in the burn, whereupon two of the dead fish together with samples of the liquid being pumped from the mine and of the water of the burn were sent here for examination. On removing the gills of the fish it was found that they were completely blocked in every fold of the gill with a finely-divided ochreous deposit. The suspended matter in the stream and in the water which purported to represent the pumpings from the mine was of the same character as the solid matter removed from the gills of the dead fish, and there could be no doubt that the presence of this suspended matter in the stream was quite sufficient to account for the death of the salmon.

The cider examined was sold as genuine apple-juice cider, but was entirely free from apple juice. On the strength of my report to the Board of Agriculture and Fisheries, a Magistrate's order was obtained and the premises of the traders searched. The result was the finding of sugar solution, aniline dyes, frothing liquid, flavouring essences, salicylic acid and other ingredients which had entered into the composition of the spurious cider. Substantial penalties were imposed upon the traders as the outcome of proceedings under the Merchandise Marks Act.

Certain of the miscellaneous butter samples were in connection with proceedings taken against a creamery in the Midlands. I had reported that the butter sold by this firm was a mixture of butter and condensed milk, and under the authority of a search warrant, an inspector found on the premises condensed-milk plant, and abundant evidence to justify the proceedings which were subsequently taken. Again, heavy penalties were imposed by the Court.

The Board of Agriculture and Fisheries, in pursuance of the power to make regulations as to the methods by which analyses are to be made, conferred upon them by the Fertilisers and Feeding Stuffs Act, asked the assistance of a Committee of representative chemical experts, of which I was appointed Chairman, to advise in the framing of such regulations. The Committee held several meetings, and ultimately submitted to the Board a series of methods of analysis for their consideration and approval. In connection with this Committee, analyses of various materials were carried out for the purpose of testing the validity of the suggested methods.

I have also had referred to me by the Board of Agriculture and Fisheries for consideration and report a number of papers on various subjects.

Board of Trade.—The following table gives the particulars of the samples of lime and lemon juice submitted for approval for use in the Mercantile Marine :—

Description.	Number of Samples.		Number of Gallons.	
	Passed.	Rejected.	Passed.	Rejected.
Lemon Juice	17	10	2,026	1,552
Lime Juice	365	8	45,920	1,028
Spirits (Rum)	25	1	2,671	16
Total	407	19	50,617	2,596

A somewhat smaller quantity of juice was approved, viz., 47,946 gallons, as against 49,519 gallons last year. Eighteen samples were found not to comply with the Board of Trade regulations, and the 2,580 gallons of juice which they represented were, therefore, rejected as being unsuitable for use in the Merchant Navy. Twelve samples of fortified juice, which had been approved more than two years previously, were retested, and four of them were found to have so deteriorated in quality as to be unfit for re-issue.

The 35 other samples examined for the Board of Trade were received from the Marine and the Standards Departments. For the Marine Department several classes of matters have engaged attention, as for example :—

(1) The degree of danger attaching to the carriage on board ship of various chemical substances and the necessity or otherwise of special regulations as to stowage ;

(2) The examination of samples of foodstuffs intended for use on board ship, the samples having been taken by the Board of Trade Inspectors of ships provisions ; and

(3) The examination of disinfectants and filters required to be carried on board ship.

In connection with the medical and surgical necessaries required under the Board of Trade regulations to be carried by vessels of the mercantile marine, a filter of approved make of a certain size and capable of delivering a sterile filtrate, and disinfectants of proved efficiency, are included. The filters deposited for approval are tested bacteriologically, and proprietary disinfectants are tested both chemically and bacteriologically. The bacteriological testing of the filters is performed at the Government Laboratory, but in the case of disinfectants the bacteriological examination is carried out at the Lister Institute of Preventive Medicine, each preparation being tested under a definite scheme of examination formulated by the Director of the Institute.

During the year, eight disinfectants submitted to the Board of Trade have been approved as exhibiting the necessary germicidal efficiency, and for other departments of the Crown three further preparations were examined and approved, whilst one was found to be below the requisite standard.

For the Standards Department of the Board of Trade two analyses of the metal used for certain measures were made, and some experiments were

undertaken for that Department with a view to determine the most suitable substance for vessels intended as measures for corrosive liquids.

Colonial Office.—For the Colonial Office, through the Crown Agents for the Colonies, five samples were examined. Two of these were hydrometers intended for Trinidad, where they were to be used as standard instruments. Of the remaining samples, one which came from Sierra Leone consisted of a flavoured syrup in connection with which the local Collector of Customs desired assistance in deciding the proper rate of duty to be levied, this depending upon whether the alcohol present had been generated in the liquid by fermentation or had been added either directly or as a component of the flavouring substance. The other two samples were sent by the Government of the Bahamas. They consisted of the samples of gin which were forwarded for analysis with a view to the detection of the presence of deleterious substances. No such substance was, however, discovered.

Commissioners of Works, London.—The samples examined during the year for this Department increased in number from 284 to 374, and the increase was generally spread over all the branches of labour controlled by His Majesty's Office of Works. The largest number of samples come from the Stores branch of the Department, and included all the substances used in connection with the cleansing of the public offices throughout the Kingdom– soaps, candles, alkalis, oils of various kinds, petroleum, polishing pastes and powders, disinfectants and even house-flannel are all carefully scrutinised, for on large purchases it is obvious that even small differences of price and quality cannot be ignored, whilst the differences in articles submitted under the same tender are frequently very considerable. To take as a single illustration the article last mentioned, it was found that four tender samples of this material differed 13 per cent. in weight per yard, and varied between 24 and 42 per cent. in the proportion of wool.

In connection with the occupancy of public buildings, 12 samples of water were analysed with a view to determine their suitability for certain special uses, and investigations were undertaken in relation to various fuels proposed as substitutes for coal and as to the effect of an alleged "coal-saver."

For the architectural and surveying branches of the Department, both English and Scottish, a large number of materials were received for examination. These included the gold-leaf proposed to be used in the redecoration of the British Museum library, the paints, in great variety, employed by contractors undertaking work for the Department in different parts of the country, bitumen asphalt, rubber and other less common substances intended for special uses, mortar from one of the historical buildings, and such like substances. Samples of stone were also submitted in connection with cases where the stone used for certain public buildings had proved defective and where the possibility of applying a remedy was submitted for consideration and advice.

Commissioners of Works, Dublin.—The samples examined for this Department consisted wholly of water. Nine samples were drawn from the supplies to the Viceregal Lodge, Dublin, and to certain coastguard stations and constabulary barracks, whilst sixteen further samples received through the Customs Department represented the supplies intended for the domestic use of Preventive Officers now substituted for men of the coastguard at stations in Ireland.

Home Office.—The samples examined for the Home Office increased in number from 77 to 230. Forty-four of these samples were connected with an investigation as to the relative character of matches made with yellow phosphorus and those made either wholly without phosphorus or phosphorus compounds—the so-called "safety matches"—or in which the comparatively innocuous phosphorus sesqui-sulphide was employed. Determinations of the temperature at which matches of these different classes ignited on being merely heated without friction were made, together with observations as to the comparative readiness with which they ignited on friction, and as to their behaviour both on general storage and when exposed to a damp atmosphere. A full report of the investigation was made to the Chief Inspector of Factories.

Ninety-seven samples consisted of pottery glazes and of glazed pottery. It will be remembered that manufacturers of pottery are now divided into four classes, viz. :—

(1) Those who use only lead-less glazes,
(2) Those who undertake to use glaze which, when tested according to the official process, shall contain not more than 2 per cent. of soluble lead compounds,
(3) Those who undertake that the soluble lead shall not exceed 5 per cent. of the glaze, and
(4) Those who do not undertake any limitation with regard to the employment of lead compounds.

A " lead-less glaze " is defined as one that contains less than 1 per cent. of lead, and of 50 samples purporting to be of this class 45 were found to be within this limit, two exceeded the limit by one-tenth and two-tenths of 1 per cent., respectively, and those contained from 1·9 to 3·8 per cent. of lead.

Of the second class only a single sample was examined and this was found to be within the required limit. In the 5 per cent. solubility division, 30 samples were examined and of these eight contained more than 5 per cent. of soluble lead monoxide. In two of these cases the excess amounted to less than 1 per cent., but in six instances the excess was considerable, the percentage of soluble lead monoxide ranging from 8 to 67 per cent. The earthenware articles which were examined as to the character of the glaze consisted of plates, saucers, finger-plates, white glazed brick, and glazed drain-pipes.

In connection with other " dangerous trade " questions, 17 samples were submitted by the Home Office. These included " file cutters' beds " ; paints employed where cases of lead poisoning had occurred and so-called " non-poisonous white lead " ; lead capsules and the dusts connected with their manufacture ; vulcanising liquids containing carbon di-sulphide, &c. " File cutters' beds " are designed to hold files whilst they are being cut, but in consequence of the injury to health arising from the inhalation of lead dust, it is provided that the metal used for the " bed " shall not contain more than 5 per cent. of metallic lead. In five suspicious cases samples were taken for analysis by the Home Office Inspectors. One of these contained less than one per cent. of lead but in the remaining four the percentages of this metal ranged between 47 and 84 per cent. For the Royal Commission on Mines, 24 samples of coal dusts taken from the underground road-ways, screens and timbers of various mines were examined and determinations made of the proportions of moisture, volatile combustible matter, fixed carbon and mineral substance present in each. In connection with a disastrous colliery explosion which occurred in South Wales causing the loss of several lives, it became of importance to endeavour to decide whether the explosion was a coal-dust explosion originated by a blasting with gunpowder or was wholly or in part due to other causes. A portion of a " shot-hole " was found *in situ* at the seat of the explosion, and it occurred to the Superintending Inspector of Mines that possibly some evidence of the character of the explosive which had been fired from the hole might be obtained if the walls of the small remaining portion of the hole were scraped and the scrapings sent for analysis, especially if scrapings from rock similar to that in which the shot-hole was found but excluded from any possible contact with the explosive were also sent for comparison.

Careful analysis of these two small samples afforded clear evidence of the presence of gunpowder in the shot-hole, and evidence to this effect was given at the inquest on the bodies of the miners killed by the explosion and at the later official legal proceedings.

The remaining samples examined for the Home Office came from the Prisons Departments of England and Scotland. They included eleven samples of water, soap of different kinds, white lead and sheeting. In one prison some suspicion of lead-poisoning had occurred, and on analysis of the water supplied to different parts of the prison premises lead in each case was found to be present. The soaps consisted of samples submitted on tender and check samples of deliveries. The sheeting was submitted for a determination as to whether it consisted of pure linen.

India Office.—There has been a very considerable increase in the samples examined for this department during the past year, the numbers having gone up from 1,094 to 1,523. One hundred of these samples consisted of standard hydrometers for use in India, and the accuracy of the indications of these instruments throughout their range was tested in the department of the Government Laboratary devoted to the examination of the hydrometers and saccharometers used in the Inland Revenue service.

The purely chemical work performed for this department was of the usual wide variety. Thus there were 121 metals including gold, silver, steel, iron and ferro-manganese, copper and copper alloys, nickel, zinc, antimony, tin, type-metal, babbits, anti-friction metal, &c. ; there were 241 cements and ganister, 28 turpentines, 162 paints of various kinds, 285 oils including simple mineral oils and compound lubricating oils, raw and boiled linseed oil, neatsfoot and other animal oils, cod and sperm, olive and rape seed oil. There were 223 preserved foods and condiments, such as condensed milk, meat extracts and essences, chocolate, soups, meat rations, oatmeal, arrowroot and pearl barley, pickles, vinegar and mustard. There were 87 fabrics of silk, wool and flax respectively, the silk being required to contain certain proportions of boric acid, but no other substance, and to be woven entirely of silk, whilst the articles of wool and flax were to consist solely of these materials. There were 122 chemicals consisting of various acids and salts, 51 disinfectants (fluids and powders), 18 cordite glycerines and mineral jellies, 13 dyes of various kinds, 33 drugs, anæsthetics and surgical dressings, 18 graphites and animal charcoals, six india-rubbers, together with samples of xylonite, asphalt, lead-glazed ware, soap, &c.

The samples representing deliveries of goods have shown a satisfactory conformity with the composition and standard of quality demanded, but, as in previous years, the tender samples sent in under a definite specification sometimes showed a wide range of variation and occasionally suggested a complete disregard of the essential demand. Thus, in connection with a supply of metallic tin intended for use in coating brass tubes, where the specification demanded that the total impurity in the tin should not exceed three-tenths of 1 per cent., a sample was submitted containing impurities amounting in the aggregate to 8·9 per cent., and in the case of a certain paint which was required to contain not less than 10 per cent. of white-lead, one of the tender samples contained no white-lead at all. Sometimes a variation is made in a name apparently with the object of covering an imitation of a substance having an established reputation. Thus, in place of "American turpentine" a sample of "English turpentine," in which the turpene had been largely replaced by a volatile hydrocarbon, was sent for examination.

Local Government Board.—The samples of London water examined for the Local Government Board have already been fully dealt with in a separate report, and it is here only necessary to say that this work has now ceased.

Apart from the periodical examination of the London water supplies, only one other sample was analysed for the Local Government Board, this being a sample of sewage effluent taken by one of the Board's inspectors.

Post Office.—Fifty-two fewer samples were examined for the Post Office during the past year as compared with the previous period, this being largely a reduction in the number of waterproof garments submitted for examination, an unusual number of which were received during the year 1906–7. Instead of 52 such garments, 10 rubber waterproofs and 10 oil-proofed articles only were examined. Eighty-eight samples of creosote oils proposed to be used for the creosoting of telegraph posts were submitted for analysis, and of these 11 were found to be unsuitable for the purpose. Eight samples of sealing-wax were examined, and in two of these an excess of mineral matter was found, and in three cases there was some deficiency of one of the more valuable constituents.

The remaining samples examined for this department consisted principally of battery materials and general stores such as zinc, tin, lead, oils, paints, rubber bicycle tyres, &c. But, in addition, chemical assistance was sought in connection with matters concerning postage stamps, inks used for postmarking and defacing, &c. Many of these latter questions, however, come not from the postal authorities direct, but through the Inland Revenue department which is charged with the control of stamps. The subjects dealt with covered questions connected

with the character of certain stamp papers, post cards, and letter cards, of the pigments used for printing the stamps, and the gum employed for rendering them adhesive. In several instances stamps were submitted which were believed to be cancelled stamps re-used, and in some of these cases there was clear evidence that tampering with the stamp had taken place, and the offenders were prosecuted. Advice was also sought from this department as to the writing ink most suitable for filling up certain important documents, the object being to secure permanency under trying climatic conditions, and to avoid danger of falsification.

Stationery Office.—For the Stationery Office eight samples of ink and gum have been examined. The samples of ink were connected with a complaint which is almost perennial, that the official ink was too thick so that it quickly loaded the pen. The so-called "writing fluids" of recent years have undoubtedly gained great popularity, and where the permanent character of the writing is a matter of indifference nothing need be said as to the convenience of a thin ink. But where permanence is essential it is well to remember that much writing is almost immediately blotted and that under such circumstances if a thin ink be used the amount of true ink remaining on the paper becomes almost infinitesimal.

In such a case it will be seen that the use of a very thin ink is not without peril. In a large number of instances the true ink is reinforced by the presence of a blue colouring matter, without which the blotted writing of an excessively thin ink would at the moment prove insufficiently clear. The staining effect of the colouring matter is immediate, whilst the black of the ink takes time to develop, and up to a certain point is, of course, proportionate to the amount of ink present.

What proportion of the colour of writing consists of ink proper and what of blue colouring matter few people stop to think, but it is desirable to remember that the world has a very extended experience of the permanence of the old inks, whilst there is no such experience in connection with the use as ink of the blue colouring substances. No one will question the advantage which arises from the presence of some blue colouring matter in ink, but for official purposes it is necessary to ensure that the ink proper shall be in sufficient proportion to afford adequate security that the writing, even when blotted, shall be reasonably permanent. There would be fewer complaints of the character of the ink supplied by the Stationery Office if greater care were exercised in the cleaning and care of the ink-wells employed in public offices.

Trinity House.—The samples examined for this department consisted of Lighthouse illuminating oils and stores of various kind. Both in number and kind they were similar to those dealt with in previous years, and they call for no special comment.

War Office.—Three departments of the War Office are in the habit of seeking the assistance of the Government Laboratory, viz., the Medical Division, the Army Clothing Department, and the Supplies Branch.

For the medical division various anæsthetics such as chloroform, ether, and ethyl chloride, medicinal oils such as cod-liver and olive oil; drugs such as the various tinctures, extracts and syrups, spirit of nitrous ether, camphor and glycerine, and general medicaments such as mercury preparations have been examined. The Army Clothing Department sends gold laces and braid to be assayed for the determination of gold and silver, and the weight of actual metal per yard of material. The largest number of samples, however, come from the Supplies Division, and consist of food substances of the most varied kind. Some of these are samples sent in under tender, others samples of bulk deliveries, and others again samples which have been stored for various periods in different portions of the British Empire, or in connection with which different opinions have been expressed as to whether such deterioration has occurred on storage as to render the article unfit for issue. Among the samples examined have been a considerable number of tinned meats, bacon, meat-extracts and essences, emergency and other rations, butter, condensed milk, chocolate, oatmeal, whole-meal, flour, semolina, rice, arrowroot, army biscuits, jam, preserved potatoes, pepper, mustard, tea, sugar, salt, dried fruits, calfs-foot jelly, &c.

III.—Reference Samples under the Sale of Food and Drugs Act and the Fertilisers and Feeding Stuffs Act.

The following samples have been examined here during the year 1907–8 under the provisions of the above Acts :—

Description.	Number of Samples.	Results.		
		Agreeing wholly or partially with Public Analyst.	Disagreeing.	No Certificate issued.
Almonds, Ground	1	1	—	—
Bacon	1	1	—	—
Brandy	1	—	1	—
Butter	10	8	2	—
Cream	1	1	—	—
Margarine	4	1	3	—
Milk	57	46	10	1
Oil of Juniper	1	—	1	—
Pepper	1	1	—	—
Spinach	2	2	—	—
Whisky	2	—	2	—
Wine	1	1	—	—
Total, Food and Drugs Act...	82	62	19	1
Fertilisers	3	3	—	—
Feeding Stuffs	2	2	—	—
Total, Fertilisers and Feeding Stuffs Act ...	5	5	—	—
Total	87	67	19	1

The number of samples referred to the Government Laboratory by magistrates was 82, compared with 114 in the previous year. The reduction in number is almost wholly due to the decrease in milk samples, the number in the present year being 29 less than in the previous year. No certificate was issued in regard to one sample of milk as the quantity in the bottle, having regard to the nature of the charge and the sour condition of the milk, was too small to admit of an accurate analysis being made.

Out of 81 samples examined we differed from the public analyst in 19 cases, or 23 per cent., against 18 per cent. last year, and 10 per cent. in 1905–6.

Details of some of the samples are as follows :—

Butter.—In the case of three of the samples the charge was excess water, and our results agreed in each case with those of the public analyst. Seven of the samples were alleged to contain foreign fat, but as regards two of these we were unable to certify that the butter was other than genuine.

Margarine.—One sample was alleged to contain water in excess of the legal limit, and the result found here agreed with the finding of the public analyst.

In two cases where a large percentage of starch was stated to be present we were able to find evidence of only a very small quantity ; and in the remaining sample of margarine submitted, which was stated to contain 57 per cent. of butter, our results indicated the presence of less than 5 per cent.

Milk.—Twenty-six samples were alleged to contain added water. In 23 of these we substantiated the charge, and in one of the others, although finding no added water, we certified deficiency in fat.

Twenty-one samples were stated to be deficient in fat, and we agreed with the public analyst in regard to 15 of these. Two were submitted on

both charges, and, while agreeing as regards one sample, we could find no evidence of added water in the other sample, although there was a large deficiency in fat.

Six were alleged to contain boron preservatives, but two of these failed to give any evidence of the presence of boric acid.

One sample was forwarded for purposes of comparison.

Brandy.—This was stated to contain not more than 75 per cent. of grape spirit, but the analytical data we obtained differed from those of the public analyst.

Whisky.—These two samples were alleged to be below the legal limit of strength, but we found both samples to conform to the requirements of the Act.

Cream.—The cream was found to contain an excessive amount of boron preservative as stated in the charge.

Oil of Juniper.—This was alleged to be adulterated with 60 per cent. of turpentine, but on comparison of the submitted sample with samples of known genuineness, both fresh and those kept for some time, we came to the conclusion that the impugned sample was genuine.

The remaining samples, in which we agreed wholly or partially with the charge, were ground sweet almonds containing oatmeal; bacon treated with boric acid; pepper adulterated with ground rice; spinach coloured with copper sulphate; and black-currant wine containing alcohol and salicylic acid.

During the year I was consulted by the Public Analyst for the States of Jersey with reference to the limits to be adopted for fat and non-fatty solids in milk sold in Jersey, as obviously the limits fixed in this country by the Sale of Milk Regulations, 1901, ought not to be applied to the much richer milk from Jersey cows. After consideration a limits were adopted to which I have agreed to have regard in considering any sample of milk that may be referred to me from Jersey, and this arrangement subsequently received the sanction of the State of Jersey in an Act passed by the Governor, Bailiff and Jurats. The regulation fixes a minimum limit of 13 per cent. for the total solids in milk which may be legally sold in Jersey. When the total solids are below 13 per cent. and the fat is less than 4·25 per cent. a presumption may be raised that fat has been abstracted. When the total solids are below 13 per cent. and the non-fatty solids are less than 8·75 per cent. a presumption may be raised that water has been added.

Fertilisers and Feeding Stuffs Act, 1906.—Under this Act, which came into operation on 1st January, 1907, the method of procedure for analysis of the reserved portion of the sample is modified. The Act prescribes as a condition precedent to a prosecution by a local authority, the consent of the Board of Agriculture and Fisheries, and this consent is not given in the case of disputed analyses until the reserved portion of the sample has been analysed by the chief analyst. In this way five samples have been submitted to me, one each of shoddy, basic slag, cotton cake, guano and bran, and in every case my certificate was in substantial agreement with that of the official agricultural analyst.

I have the honour to be,
My Lords,
Your obedient Servant,
T. E. Thorpe.

11th June, 1908.

APPENDIX A.

TOTAL NUMBER of ANALYSES and EXAMINATIONS made in the LABORATORY, at CLEMENT'S INN PASSAGE, during the year ended 31st March, 1908.

	NUMBER OF ANALYSES.
Revenue Departments :—	
Worts and materials (beer duty)	7,509
Beer, for exportation	8,034
Beer, for dilution, &c.	7,103
Herb beers, &c.	1,106
Yeast pressings and wash	1,352
Glucose, for duty and drawback	631
Worts, beers, &c., for arsenic	1,328
Medicinal tinctures, for drawback	19,050
Compounds, liqueurs, and wines	4,187
Compounds, for sugar estimations	1,898
Naphtha (wood for methylating)	782
Naphtha (mineral for methylating)	274
Tobacco, for drawback	7,245
Snuff, for drawback	184
Tobacco, stalks, shorts, and offal, for drawback	48,928
Tobacco, for moisture	12,057
Tobacco, for oil	2,913
Tobacco and snuff, for adulteration	1,157
Hydrometers, saccharometers, &c.	3,440
Stamps and pigments	672
Miscellaneous	1,191
Other Departments :—	
Admiralty	277
Board of Agriculture and Fisheries	2,308
Board of Trade	442
Colonial Office	5
Commissioners of Works, London	374
Commissioners of Works, Dublin	9
Home Office	230
India Office	1,523
Local Government Board	1,200
Post Office	168
Stationery Office	8
Trinity House	165
War Office	422
Food and Drugs and Fertilisers and Feeding Stuffs Acts	87
Total	138,259

APPENDIX B.

TABLE showing the NUMBER of SAMPLES tested at the EXCISE CHEMICAL STATIONS during the year ended 31st March, 1908.

Station.	Beer for Exportation.		Worts.	Tobacco.		Miscellaneous.	Total.
				For Moisture.	For Oil.		
	Samples.	Barrels.	Samples.	Samples.	Samples.	Samples.	Samples.
Belfast	6	9	9	814	—	354	1,183
Bristol	94	2,840	120	920	—	61	1,195
Burton	—	—	1,049	—	—	1	1,050
Cork	—	—	216	306	—	51	573
Dublin	58	4,737	338	474	—	519	1,389
Edinburgh	282	12,251	240	1,342	—	233	2,097
Glasgow	2,083	91,938	47	1,167	453	485	4,235
Leeds	—	—	473	243	—	9	725
Liverpool	3,615	94,164	100	1,359	874	273	6,221
Newhaven	94	2,679	65	—	—	—	159
Southampton	675	16,908	103	—	—	9	787
Total	6,907	225,526	2,760	6,625	1,327	1,995	19,614

APPENDIX C.

TABLE showing NUMBER of SAMPLES tested at the CUSTOMS TESTING PORTS and STATIONS, other than the LABORATORY, CUSTOM HOUSE, LONDON, during the year ended 31st March, 1908.

Ports.	Beer.			Cider and Perry.	Spirits.		Wine.		Sugar.			Molasses and Syrups.			Miscellaneous.	Totals.
	Foreign on Importation.	On Exportation.	British Returned.		For Obscuration, Brandy, Geneva, Rum.	Compounds, Liqueurs, &c.	By Hydrometer.	By Gravity Bottle.	On Importation.	On Exportation.	Refinery.	On Importation.	On Exportation.	Refinery.		
Belfast	54	—	—	—	120	4	108	—	—	—	—	—	—	—	—	286
Bristol	80	2	—	8	2,043	62	3,568	—	68	163	2	—	—	—	99	6,095
Cardiff	—	—	—	1	33	7	176	—	—	—	—	—	—	—	4	221
Cork	—	—	—	—	14	3	67	—	—	—	—	—	—	—	—	84
Dublin	425	—	—	—	497	27	2,238	—	—	—	—	—	—	—	6	3,193
Folkestone	—	—	—	1	56	503	695	—	—	—	—	—	—	—	114	1,374
Glasgow	—	—	—	6	1,000	734	3,621	—	3	257	—	340	4	—	—	5,965
Greenock	—	—	—	—	19	15	1	—	1,863	4	4,052	84	—	816	—	6,854
Harwich	283	—	—	13	65	367	668	—	—	—	—	—	—	—	180	1,556
Hull	1,025	—	—	3	990	265	1,789	—	—	—	—	—	—	—	11	4,083
Leith	1,735	—	—	5	923	264	3,790	—	376	52	—	—	—	—	—	7,145
Liverpool	311	44	—	25	3,952	351	20,292	52	4,511	388	2,128	593	622	662	123	34,059
London	—	—	—	—	6,667	877	39,648	518	5,954	1,100	2422	—	—	—	—	57,186
Manchester	2	—	—	1	62	39	361	12	—	—	—	—	—	—	—	480
Newhaven	—	—	—	85	1,857	447	1,500	—	—	—	—	—	—	—	—	3,889
Southampton ..	74	18		66	1,881	258	1,012	—	3	76	—	—	—	—	2,286	5,674
Totals ..	3,989	64	—	214	20,179	4,228	79,537	582	12,778	2,040	8,604	1,017	626	1,478	2,808	138,144

APPENDIX D.

RETURN of the QUANTITIES of INDUSTRIAL METHYLATED SPIRIT used in MANUFACTURING OPERATIONS and for other purposes in the UNITED KINGDOM during the Year ended 31st March, 1908.

(Prepared from Official Returns made by Manufacturers and other Users.)

—	Nature of Manufacturing Operations or other purposes for which the Industrial Methylated Spirit is used.	Quantity used during the year ended 31st March, 1908.
		Gallons.
1	Manufacture of Finish for sale	363,074
2	„ Varnishes, Polishes, and Lacquers for sale	886,485
3	„ Stains, Paints, Enamels, &c. for sale	49,203
4	„ Varnishes, Finish, Stains, Lacquers, &c., and Spirit used for Polishing Purposes in Manufacturers' own Workshops	257,100
5	„ Felt Hats	116,590
6	„ Celluloid, Xylonite and similar substances	19,561
7	„ Oil-cloths, Leather-cloths, Pegamoid and similar substances	200,944
8	„ Linoleum and similar substances	536
9	„ Smokeless Powders, Fulminates and other Explosives	18,596
10	„ Soap	136,399
11	„ Electric Lamp Filaments	15,291
12	„ Electric Cables	4,937
13	„ Incandescent Gas Mantles	16,888
14	„ Ether	166,460
15	„ Chloroform	19,941
16	„ Ethyl Chloride and Bromide	835
17	„ Solid Medicinal Extracts	21,261
18	„ Alkaloids and Fine Chemicals	21,146
19	„ Embrocations, Liniments, and Lotions	30,006
20	„ Surgical Dressings	5,311
21	„ Capsules and other Medicinal Appliances	2,270
22	„ Hair Washes	6,444
23	„ Cattle Medicines	1,357
24	„ Plant Washes, Insecticides, and Sheep Dips	8,431
25	„ Aniline and other Dyes	4,270
26		
27	„ Fireworks and Matches	4,460
28	„ Photographic Plates and Papers, and other Photographic Purposes	37,423
29	„ Steel Pens	2,324
30	„ Silk, Crape, and Embroidery	6,595
31	„ Artificial Flowers, &c.	2,630
32	„ Rubber	3,327
33	„ Artificial Silk	
34	„ Ships' Compasses, Spirit Levels, &c.	695
35	„ Inks	2,094
36	For Dyeing and Cleaning Operations in Laundries and Dye Works	42,889
37	„ Calico Printing	5,479
38	„ Preservation of Specimens in Museums and Hospitals	8,442
39	„ Educational and Scientific Purposes in Colleges and Schools	4,968
40	„ Analytical and Scientific Purposes in the Laboratories of Analysts, Works Chemists, &c.	4,421
41	„ use in Hospitals, Asylums, and Infirmaries	40,593
42	„ Electrotyping and Printing	1,381
43	„ various Miscellaneous Manufactures, including Cements, Disinfectants, &c.	10,740
44	„ Admiralty Dockyards and War Office, Arsenals and Workshops, chiefly for Varnishes and Polishes	15,293
	Total Quantity used	2,567,090

NATIONAL GALLERY (REPORT).

RETURN to an Order of the Honourable The House of Commons, dated 27 February 1908;—*for*,

COPY "of REPORT of the DIRECTOR OF THE NATIONAL GALLERY, for the Year 1907, with APPENDICES."

Treasury Chambers,
28 February 1908.

WALTER RUNCIMAN.

(*Mr. Runciman.*)

Ordered, by The House of Commons, *to be Printed*, 28 *February* 1908.

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REPORT.

National Gallery, Trafalgar Square, London,
28 January 1908.

MY LORDS,

I HAVE the honour to submit to your Lordships the following Report on the National Gallery, and the National Gallery, British Art, for the year 1907.

The present Trustees are, in the order of their nomination,—

The Earl of Carlisle.	Earl Brownlow.
Alfred C. de Rothschild, Esq., C.V.O.	Sir John Murray Scott, Bart., K.C.B.
John P. Heseltine, Esq.	Earl Plymouth, and
The Marquess of Lansdowne, K.G.	Sir Thomas D. Gibson-Carmichael, Bart.

The subjects of the Report are :—

I.—Pictures purchased during the Year.

II.—Bequests and Donations to the Collection.

III.—Loans to the Gallery.

IV.—Works transferred from one Gallery to the other, newly exhibited, or withdrawn from exhibition.

V.—Loans to other Institutions.

VI.—Details relating to the Galleries and Establishments.

I.—PICTURES PURCHASED DURING THE YEAR.

(A. Purchased out of the Grant in Aid Account.)

1. "Portrait of Il Marchese Giovanni Battista Cattaneo," by Sir A. Van Dyck,
2. "Portrait of La Marchesa Cattaneo," by Sir A. Van Dyck.*

(B. Purchased out of the "Lewis Fund.")

3. "Une Parade," by Gabriel de Saint-Aubin.
4. "Gordale Scar, Yorkshire" (small study for No. 1043), by James Ward, R.A.
5. Thirty-three sheets of drawings, by Alfred Stevens.
6. "The Magdalen," Antwerp School.
7. "Portrait of the Artist," by Joseph Ducreux.†

(C. Purchased out of the "Clarke Fund.")

8. "The Music Lesson," by Frank H. Potter.

II.—BEQUESTS AND DONATIONS TO THE COLLECTION.

Bequeathed by Mrs. Bruce-Gordon.

1. "Portrait of the Duke of Wellington," by Robert Home.

Bequeathed by Mrs. Edwin Edwards.

2. "Roses," by Henri Fantin Latour.
3. "Apples," by Henri Fantin Latour.
4. "The Marsh of Arleux," by Jean Baptiste Camille Corot.

* The completion of the purchase of this picture has, by the direction of the Lords Commissioners of H.M. Treasury, been deferred until 1908–9.

The picture of "Lulli and his fellow musicians at the French Court" No. 2081, by Hyacinthe Rigaud, was purchased in 1906 from the Comtesse de Coullanges for the sum of 2,000*l.* The price was inadvertently omitted from the description in the Report for that year.

† The picture by F. Y. Hurlstone, No. 1967, purchased in 1905, was bought out of this fund for 75*l.*, not 250*l.* as stated in the Report for that year.

Bequeathed by Mr. Henry Callcott Brunning.

5. "Woody Landscape," by James Stark.
6. "Interior of a Gothic Church," by Hendrick v. Steenwyck.
7. "Interior of a late Classic Church," by Pieter Neeffs.
8. "Vespers," by Pieter Neeffs.
9. "After Vespers," by Pieter Neeffs.
10. "A View in Sussex," by Patrick Nasmyth.

Presented by Miss Clare Atwood on behalf of friends of the late Miss Ethel Parker.

11. "The Pink Palace," by H. B. Brabazon.
12. "The Grand Canal," by H. B. Brabazon.
13. "Studies," by Alfred Stevens.

Presented by Mrs. Harvey Combe.

14. "Houses at Tivoli," by H. B. Brabazon.
15. "Roses," by H. B. Brabazon.
16. "Murcia," by H. B. Brabazon.
17. "Tivoli," by H. B. Brabazon.

Presented by Mr. J. S. Sargent, R.A.

18. "Les Rochers Rouges," by H. B. Brabazon.

Presented by Mr. J. Moser, J.P., through the Trustees and Committee of the Whitechapel Art Gallery, in commemoration of the Jewish Exhibition, 1906.

19. "Jews Mourning in a Synagogue," by W. Rothenstein.

Presented by His Honour Judge Evans.

20. "Portrait study of Mr. John Gray," by Professor A. Legros.

Presented by Mr. John Maddocks, J.P.

21. "Will it Rain?" by James Charles.

Presented by Mrs. James Charles.

22. "Heads and Groups of Figures," by James Charles.
23. "Landscape and Figures," by James Charles.
24. "Study: A Country Road," by James Charles.

Presented by Professor Frederick Brown.

25. "Studies of Sheep," by James Charles.
26. "Studies in the Hayfield," by James Charles.

Presented by a body of Subscribers.

27. "The Ship," by W. Holman Hunt.

Presented by Mr. John R. Clayton.

28. Sheet of Studies for "Isaiah" Cartoon, by Alfred Stevens.

Presented by Mr. George Salting.

29. "The Virgin and Child," by Giovanni Francesco da Rimini.

Presented by Mrs. Charles L. Eastlake.

30. "Ulricus Sirosenius, Duke of East Friesland," Dutch School, 16th century.

Presented by Mr. John P. Heseltine.

31. "The Water Lane," by Jan Siberechts.

Presented by Sir Charles Robinson, C.B., through the National Art Collections Fund.

32. "The Pic-nic," by Sir David Wilkie, R.A.

Presented by Mr. J. Duveen, junr. and others through the National Art Collections Fund.

33. "Portrait of Mr. John Morris Moore," by Alfred Stevens.

Presented by the Comtesse de Coullanges.

34. "Portrait of Jean Baptiste Lully" (an engraving), by Auguste de Saint-Aubin.

Presented by Mr. Henry J. Pfungst, F.S.A.

35. "The Lady at the Spinet," by Jacob Ochtervelt.

Presented by Mrs. Bywater.

36. A water-colour copy of "The Virgin and Child," by Domenico Veneziano, numbered 1215 in the National Gallery.

Presented by Mr. J. F. Waggett.

37. Two black marble plinths.

Presented by Mr. J. Duveen.

38. A carved French frame for the picture by Hyacinthe Rigaud of "Lulli and the Musicians of the French Court," No. 2081 in the National Gallery.

Presented by the Misses Sharpe.

39. "Peace came down upon the Earth," by Thomas Stothard, R.A.

Presented by Mr. H. H. Finch.

40. Five studies in pencil and water-colour on tinted paper, by J. F. Lewis, R.A.

Presented by Mr. A. E. Anderson.

41. "The Watering Place" (a print from a soft ground etching), by Thomas Gainsborough, R.A.

The five following works of art were purchased for the nation by the President and Council of the Royal Academy of Arts under the terms of the Chantrey Bequest :—

"The Rehearsal," by L. Campbell Taylor.
"Runswick Bay," by A. Friedenson.
"The Seeds of Love," by W. G. Simmonds.
"The Earth and the Elements" (marble group), by B. Mackennal.
"Girl and Lizard" (bronze), by S. M. Wiens.

(For details, *see* Appendix, No. 2.)

III.—Loans to the Gallery.

Mr. George Salting's loan of important pictures by Corot, Diaz, and Daubigny, and Mr. Drucker's loan, which he has generously promised shall be permanent, of works by modern Dutch and French painters, help considerably to augment the very small collection of pictures by modern Continental Masters in the possession of the Trustees. They together form a valuable nucleus round which it is hoped further works will congregate, so that an adequate representation of the best modern developments of Continental art may be properly and separately shown in the additional space shortly to be placed at the disposal of the Trustees.

Lent by Mr. J. C. J. Drucker.

1. "Mother and Child," by Jacob Maris.
2. "The Draw-bridge," by Jacob Maris.
3. "Watering Horses," by Anton Mauve.
4. "Interior of Haarlem Cathedral," by Johannes Bosboom.
5. "The Philosopher," by Josef Israels.
6. "Grandfather's Birthday," by Eugène Isabey.
7. "Fish Market, Dieppe," by Eugène Isabey.

Lent by the Victoria and Albert Museum.

8. "The Adoration of the Magi," by Lo Fil de Mestre Rodrigo.

Lent by Sir Hickman B. Bacon, Bart.

9. "A Tavern Scene," by Adrian Brouwer.

Lent by Sir George Donaldson.

10, "Portrait of Bona of Savoy," by Ambrogio de Predis.

Lent by Mr. George Salting.

11. "St. Clement and Donor," by the Master of Jehan Perreal.
12. "The Virgin and Child," by the Maître de Flémalle.
13. "The Leaning Tree," by J. B. C. Corot.
14. "The Wood-gatherer," by J. B. C. Corot.
15. "Evening on the Lake," by J. B. C. Corot.
16. "Noon," by J. B. C. Corot.
17. "The Storm," by N. V. Diaz de la Peña.
18. "Willows and Fishers," by C. F. Daubigny.

(For details, *see* Appendix, No. 3.)

IV.—Works Transferred from one Gallery to the other, Newly Exhibited, or Withdrawn from Exhibition.

The following large pictures, by James Ward, R.A., have been transferred from the Gallery in Trafalgar Square to the Gallery of British Art at Millbank :—

No. 688. "Landscape with Cattle."
„ 1043. "A Landscape : Gordale Scar, Yorkshire."

"The Holy Family," by Sir Joshua Reynolds, No. 78A, which had, for more than 30 years past, been withdrawn from the walls of the Gallery as unfit for exhibition, and was in a deplorable state, covered with hard-blackened varnish and badly cracked, has been relined, cleaned, and restored by Mr. A. H. Buttery with such success that the picture has been again exhibited and hung in Room XVIII. Mr. Buttery received the thanks of the Trustees for this skilful restoration.

V.—Loans to other Institutions.

Of the six Collections of Turner drawings and sketches available for temporary loan to provincial institutions, No. 1 was lent to Carlisle in March last and returned in the August following, and remains for the present deposited in the National Gallery, Trafalgar Square; Nos. 3 and 4 still remain at the Royal College of Art, South Kensington, and Municipal School of Art at Manchester, respectively; Nos. 2, 5, and 6, having been returned from Glasgow, Bristol, and Hanley, remain for the present deposited in the National Gallery.

In order to verify the dates and descriptions of the Turner drawings and note-books lent to the University Galleries, Oxford, in 1879, it was desirable that this loan should be returned to the National Gallery so that the drawings might be compared with the rest of the Collection and take their chronological places in the Inventory in course of preparation by Mr. Finberg. Accordingly the 250 drawings and eight "extra pieces" were returned to the National Gallery in January last.

The following seven works belonging to this Collection were lent in April last to the Irish International Exhibition, Dublin, and have since been returned to the National Gallery :—

No. 677. "Portrait of Lewis, the Comedian," by Sir Martin A. Shee, P.R.A.
„ 423. "Malvolio and the Countess," by D. Maclise, R.A.
„ 437. "The Fisherman's Home," by F. Danby, A.R.A.
„ 394. "Fair Time," by W. Mulready, R.A.
„ 1743. "Academy Study," by W. Mulready, R.A.
„ 1744. "Academy Study," by W. Mulready, R.A.
„ 1745. "Academy Study," by W. Mulready, R.A.

The following pictures, which had been on loan since April 1895 and September 1904 at Blackburn and Bootle respectively, were returned to the National Gallery during the past year :—

No. 139. "Religion attended by the Virtues," by Angelica Kauffmann.
„ 289. "The Night Watch," by Gerrit Lundens.

Lent to the National Portrait Gallery.

No. 2128. "Portrait of the 1st Duke of Wellington," by Robert Home.

The picture of "Punch, or May Day," by Benjamin Haydon, which had been on loan in the Art Gallery at Leicester during the past 23 years, has been returned to the National Gallery for relining and repair.

The two following pictures have been lent for a term of five years to the Municipal Art Gallery at Dublin :—

No. 423. "Malvolio and the Countess," by D. Maclise, R.A.
„ 677. "Portrait of Lewis, the Comedian," by Sir Martin A. Shee, P.R.A.

The two following pictures from the Chantrey Collection have, with the sanction of His Majesty's Treasury, been temporarily lent to the following institutions, in pursuance of a custom initiated by the Royal Academy, and in response to a general desire that they might be seen in the provinces before being finally housed in the National Gallery of British Art :—

"The Rehearsal," by L. Campbell Taylor, to the Walker Art Gallery, Liverpool.
"Runswick Bay," by Arthur Friedenson, to the Royal Society of Artists, Birmingham.

VI.—Details relating to the Galleries and Establishments.

The Re-hanging of the Galleries at Trafalgar Square.

Several of the rooms at Trafalgar Square have been re-hung so as to carry further the arrangement of the pictures in Schools, and to place related Schools in adjacent galleries. With this object in view the early Dutch and Flemish pictures have been removed from Room IV. to Room XI., which is adjacent to the large Dutch Room X. The miscellaneous pictures of the later Italian Schools, which hung in Room XIII., entirely separated from the other Italian pictures, have been hung with the Schools to which they belong. Most of these pictures are in Room IX., which has been devoted principally to works of the later Venetian School. The Lombard School pictures, formerly in Room IX., have been placed in Room IV., adjacent to the Florentine School, which influenced the later developments of the Lombard School, through Leonardo da Vinci. Room XIII. has been used for pictures of the Flemish School and Rubens, whose works alone would have adequately filled the space. The Flemish masters have been separated from the Dutch masters, from whom they differ considerably both in sentiment and technique. As far as space allowed the pictures have been arranged in chronological order in Schools ; and each master's works have been hung, if not actually together, at least near enough to be easily referred to by the student.

The pictures of the British School have also been re-arranged by placing the works of individual masters together, or as nearly so as possible, so that they may be the more easily compared. Room XIX. has been devoted more particularly to Hogarth, Room XVII. to Reynolds and Wilson, Room XX. to Gainsborough, Crome, Constable, and the painters of the Eastern Counties, and Room XXI. to Romney, Morland, Millais, and other masters. Room XXII. is, as before, the Turner Room, but it is insufficient for the proper exhibition of this great Bequest.

Re-decoration of the Exhibition Rooms at Trafalgar Square.

The necessity of deciding whether certain of the rooms in the Gallery cannot be better protected from the possibility of damage by fire, and unavoidable delay in deciding this important point, have postponed the re-decoration of those rooms. This work which is so evidently and urgently needed, will, it is earnestly hoped, be carried out by H.M. Office of Works in the course of the current year.

Extension of the Gallery at Trafalgar Square.

The building operations for the long-desired extension of the Gallery in the rear of the present buildings are in full progress.

The Turner Collection of Drawings.

The work of arranging and making a comprehensive inventory of the Turner drawings in the possession of the Trustees has made substantial progress, and Mr. A. J. Finberg, who is carrying it out under the supervision of the Director, has visited 21 provincial galleries in the course of the year in order to inspect

drawings in these galleries and settle questions of date and subject. The arrangement of the unexhibited drawings is completed, as is the rough inventory; and the detailed inventory has been carried down to the year 1830, and to this point is ready for press. It is believed that the work will be completed by the end of March 1909.

Pictures on Loan at Provincial Galleries.

The Director has utilised Mr. Finberg's visits to provincial galleries to obtain detailed reports of the condition of all the National Gallery pictures lent to such galleries, and arrangements have been made for the return of pictures for cleaning and repair, as need has arisen or may arise. A large number of these loans has remained undisturbed since 1884, and some revision of their distribution has also been considered.

Important Bequest by Colonel Temple West.

In 1903 the Trustees were informed of a large bequest to the Gallery by the late Colonel Temple West, but, as the will was disputed, it was necessary to refer the matter to H.M. Treasury. In the course of the past year a satisfactory arrangement was reached by the Solicitor to H.M. Treasury, and sanctioned by the High Court; and up to the present date a total sum of 94,805*l.* 9*s.* 1*d.* has been received on account of capital, and 1,261*l.* 8*s.* 3*d.* on account of interest, and the capital sum has been invested by the Trustees in accordance with the terms of the will in the following securities:—

37,900*l.* in 2½ per cent. Consolidated Stock.
33,742*l.* 3*s.* 11*d.* in Transvaal 3 per cent. Stock.
31,300*l.* in London County 3½ per cent. Stock.
The interest only of this capital sum is available for the purchase of pictures.

Messrs. Cassell's 6d. Illustrated Catalogue.

An arrangement has been made, in force since December 1st, 1907, terminable at the discretion of the Trustees, by which Messrs. Cassell's 6*d.* illustrated catalogues are, with the approval of H.M. Treasury, sold by the officials at both Galleries, and the sales accounted for, with those of the Official Catalogues, to H.M. Stationery Office, to which Department Messrs. Cassell have agreed to supply copies at a discount of 1½*d.* per copy or 25 per cent. The amount of this discount is placed to the credit of H.M. Stationery Office.

Re-hanging of Pictures at Millbank.

The transfer of the two great pictures by James Ward to the National Gallery of British Art made a certain amount of re-hanging necessary, and this was carried out in conjunction with a larger change. Since the foundation of the Gallery 10 years ago, the pictures of the Tate Gift had been hung as a separate Collection. With the assent of Lady Tate, it was decided to distribute them in their natural order among the other pictures.

Rooms I—VI are now hung accordingly in chronological order for the main part; and by placing a certain number of pictures in the balcony it has been found possible to arrange almost the whole Collection on the level of the eye without undue crowding.

Two doorways which it was possible to dispense with, between Rooms IV and VII and Rooms XI and XII respectively, have been filled up, with the result that some extra wall space has been obtained and greater convenience in hanging these rooms. Advantage was taken of the removal of the Watts and Turner pictures during the alterations to re-paint Rooms VII and XI. The two corridors leading to the Sculpture Gallery have been utilized for hanging a number of drawings, and the Chantrey water-colours, with some others, have been placed in Room XVII.

Pedestals for Sculpture.

Painted wooden pedestals for sculpture have been substituted in several instances for those covered with stuff, and a glass case has been provided for Mr. Mackennal's small marble group.

Exhibition of Turner Relics.

An interesting collection of Turner relics has been lent for exhibition in the Gallery of British Art by Mr. C. Mallord Turner, and will shortly be on view in Room XI.

Reference Library at Millbank.

The Director has been authorized to expend a sum, not exceeding 25*l.*, out of the annual allowance of 100*l.* or less provided for the maintenance of the "Eastlake" Library, in providing books expressly for the use of the Gallery of British Art, to be kept there for the convenience of reference.

PICTURES SURFACE CLEANED OR REPAIRED AND VARNISHED.

No. 2069. "The Madonna of the Tower," by Raffaello Sanzio (blister laid down).

No. 2081. "Lulli and the Musicians of the French Court," by Hyacinthe Rigaud (re-lined, surface cleaned, and varnished).

No. 1130. "Christ washing His Disciples' Feet," by Jacopo Robusti (surface cleaned).

No. 512. "Caligula's Palace and Bridge," by J. M. W. Turner, R.A. (re-lined, repaired, cleaned, and varnished).

No. 1043. "A Landscape: Gordale Scar," by James Ward, R.A. (surface cleaned and varnished).

No. 688. "Landscape with Cattle," by James Ward, R.A. (re-lined, surface cleaned, and varnished).

No. 51. "Portrait of a Jew Merchant," by Rembrandt (surface cleaned and varnished).

No. 78A. "The Holy Family," by Sir Joshua Reynolds, P.R.A. (re-lined, repaired, cleaned and varnished).

No. 811. "Forest Scene, with Tobias and the Angel," by Salvatore Rosa (re-lined, cleaned and varnished).

No. 2132. "Portrait of John Morris Moore," by Alfred Stevens (re-lined, cleaned and varnished).

No. 1585. "Psyche," by G. F. Watts, O.M., R.A. (varnished).

No. 1494. "The Yeoman of the Guard," by Sir John E. Millais, Bart., P.R.A., (varnished).

No. 2108. "The Music Lesson," by Frank H. Potter (varnished).

Number of Visitors to the Galleries.

The Gallery in Trafalgar Square was visited by 567,659 persons on the *free* days during the year, showing a daily average attendance on such days (208 in number) of 2,733.

In addition to the above number, 43,618 persons visited the Gallery on the 30 Sunday afternoons on which it was opened during 1907, showing a daily average attendance of 1,453.

On Students' days (Thursdays and Fridays) 57,941 persons were admitted between the 1st of January and the 31st of December 1907; the admission fees (at 6*d.* each) amounting to 1,448*l.* 10*s.* 6*d.*, as compared with 1,584*l.* 5*s.* 6*d.* received in 1906.

The National Gallery of British Art at Millbank has been visited by 292,816 persons on the *free* days during the year, showing a daily average attendance on such days (207 in number) of 1,414.

In addition to the above number 38,827 persons visited the Gallery on the 30 Sunday afternoons on which it was opened in 1907, showing a daily average attendance of 1,294.

On Students' days (Tuesdays and Wednesdays) 40,222 persons were admitted between the 1st of January and the 31st of December 1907; the admission fees (at 6*d.* each) amounting to 1,005*l.* 11*s*, as compared with 1,205*l.* 3*s.* 6*d.* received in 1906.

The amount annually realised by admission fees at both Establishments is devoted as an "Appropriation in Aid" of the Parliamentary Vote to the National Gallery.

(*See* Appendix, No. 4.)

Copying Pictures in the Galleries.

The total number of students' attendances at the Gallery in Trafalgar Square on Thursdays and Fridays throughout the year was 16,466. Independently of partial studies, 621 oil-colour copies of the pictures have been made, viz.:—356 from the works of 83 Old Masters, and 265 from the works of 22 Modern Painters.

Two hundred and one new students have been entered on the books during the year.

The total number of students' attendances at the Gallery of British Art on Tuesdays and Wednesdays throughout the year was 8,419; and 386 completed copies of the pictures have been made in oil-colours, 79 in water-colours, and 19 in pastel.

One hundred and five new students have been entered on the books during the year.

Catalogues of Pictures.

The 80th edition of the Catalogue of Pictures belonging to the Foreign Schools is still on sale (1*s.* per copy) at the Gallery in Trafalgar Square.

An abridged edition of the same is also on sale, price 6*d.* per copy. The 76th edition of the Catalogue of Pictures belonging to the British School is still on sale at 6*d.* per copy. Messrs. Cassell & Co.'s Catalogue, containing over 100 illustrations of the pictures in Trafalgar Square, is now on sale at 6*d.* per copy.

The 15th edition of the Catalogue of Pictures and Sculpture in the National Gallery of British Art at Millbank is on sale in that building, price 6*d.* per copy. Messrs. Cassell & Co.'s illustrated catalogue is also now on sale at the same price.

The proceeds of sales at both Establishments are paid into His Majesty's Exchequer through the Stationery Office.

The total number of Catalogues sold in 1907 at both Establishments was 23,746, as compared with 21,123 sold in 1906.

(*See* Appendix, No. 5.)

Details relating to the Establishments.

John R. H. Dean, appointed in 1893 an Assistant Porter at Trafalgar Square, and promoted in 1902 to an Attendantship, having suffered for some time past from a weakness of sight, which culminated in total blindness, was, with the regret of the Trustees, dismissed from the service of the Gallery in February last, and has since been granted by His Majesty's Treasury a pension of 22*l.* 15*s.* 10*d.* per annum. (*See* Treasury Letter, 9th March 1907.)

H. G. Tyrer, Senior Assistant Porter, has been promoted to the vacancy thus occasioned.

A. J. Messer, appointed in 1901 an Assistant Porter at Trafalgar Square, on a special medical report of his unfitness for the performance of his duties, was reluctantly dismissed from the service of the Trustees in August last.

E. W. Steward and A. T. Gray have been appointed to the vacant Assistant Porterships vacated by the promotion of H. G. Tyrer and the dismissal of A. J. Messer. (*See* Treasury Letters, 22nd March and 19th September 1907.)

E. N. Poynter, Assistant Porter at Trafalgar Square, died on 24th November 1907, and the vacancy thus occasioned on the Porters' Staff has not yet been filled up.

The Police Staff on duty at both Establishments remains at the same strength as in 1906, viz.:—2 Inspectors, 1 Sergeant, and 20 Constables at the Gallery in Trafalgar Square, and 3 Sergeants and 9 Constables at the Gallery of British Art.

The Financial Accounts relating to both Establishments are sent in by the Accounting Officer monthly and annually to his Majesty's Exchequer and Audit Department.

I have the honour to be,
My Lords,
Your obedient Servant,
CHARLES HOLROYD,
Director.

The Lords Commissioners of
His Majesty's Treasury.

APPENDICES.

Appendix No. 1.

Details respecting Pictures Purchased during the Year.

(A. *Purchased out of the Grant-in-Aid Account.*)

1. *Sir Anthony Van Dyck.* (1599–1641.) Flemish School. "Il Marchese Giovanni Battista Cattaneo." A virile portrait of an Italian nobleman with keen eyes, a high forehead, and a slight beard. He wears a black dress and a white linen collar edged with lace, and has a plain gold ring on the third finger of his right hand. He is putting a paper into the breast of his coat. His left hand touches the frame. In the background are dimly seen some buildings and a dark sky. The portrait is nearly full-face turning slightly to the right, half-length, and of the size of life.

Canvas, 2 feet 2 inches high by 2 feet wide.

Formerly in the Collection at the Cattaneo Palace, Genoa. The picture was painted for the Cattaneo family shortly after the artist's arrival in Italy in the autumn of 1621, and is an example of his Genoese manner.

Purchased from Messrs. P. and D. Colnaghi for 13,500*l.*, of which amount Messrs. Colnaghi contributed 1,000*l.*

Hung in the Gallery at Trafalgar Square, Room XIII., No. 2127.

2. *Sir Anthony Van Dyck.* (1599–1641.) Flemish School. "La Marchesa Cattaneo." A portrait of the wife of the Marchese Giovanni Battista Cattaneo, and the companion to No. 2,127. The lady is represented as turned to her right, looking out of the picture to her left. Her expression is smiling, and she has dark auburn hair. A red flower is placed over her left ear, from which hangs a large pearl ear-ring. She wears a black dress, a large lace ruff round her neck, and small ruffles on her wrists. Her right hand holds a long chain of large beads which hangs round her neck, and on her first finger is a ring containing a single square stone. A red curtain hangs in the background.

A half-length portrait, three-quarter face turned to the left.

Canvas, 2 feet 5 inches high by 2 feet wide.

Formerly in the Collection at the Cattaneo Palace, Genoa. The picture was painted for the Cattaneo family shortly after the artist's arrival in Italy in the autumn of 1621, and is an example of his Genoese manner.

Purchased from Messrs. P. and D. Colnaghi for 13,500*l.*, of which amount Messrs. Colnaghi contributed 1,000*l.* Completion of this purchase has, with the authority of His Majesty's Treasury, been deferred until 1908–9.

Hung in the Gallery at Trafalgar Square, Room XIII., No. 2144.

(B. *Purchased out of the "Lewis Fund."*)

3. *Gabriel Jacques de Saint-Aubin.* (1724–1780.) French School. "Une Parade." Two mountebanks are fencing on a platform, behind which hangs an advertisement sheet. A group of citizens is standing under the trees of a boulevard watching them. A drummer boy has fallen asleep on the right. A dog barks in the foreground, and spectators are hurrying towards the players on the left. A young woman, holding a pink parasol, looks out from the window of a neighbouring house.

Canvas, 2 feet 8 inches high by 2 feet 1 in. wide.

Formerly in the Baring Collection under the name of Gillot, but recognised by Mr. J. P. Heseltine as the original of an engraving, reproduced without the artist's name, in "Les Théâtres Libertins," plate 1, page 2, Paris 1905. The Trustees and Director are indebted to Mr. Gaston Schéfer, of the Bibliothèque de l'Arsenal, Paris, for his researches, which have resulted in the discovery, at the Bibliothèque Nationale, in a portfolio of theatrical prints, of an unfinished proof of this engraving after the picture dated 1760, and inscribed in an old handwriting, "Gabriel de St. Aubin, pinxt."

Purchased from Messrs. T. Agnew and Sons for 99*l.* 15*s.*

Hung in the Gallery at Trafalgar Square, Room XVII., No. 2129.

4. *James Ward, R.A.* (1769–1859.) British School. "Gordale Scar (a study)." This is a sketch for the landscape setting of the great picture recently transferred to the Gallery of British Art.

Oil on brown paper, 12½ inches high by 1 foot 4½ inches wide.

Purchased from Mr. R. W. Howes for 45*l.*

Hung in the Gallery of British Art, Room I., No. 2142.

5. *Alfred Stevens.* (1818–1875.) British School. Thirty-three sheets of studies, chiefly in red chalk, but a few in pencil. Many of the sheets have studies on the back as well as the front. They are in course of being catalogued in detail, and a selection will shortly be ready for exhibition. The following is a general description:

Nos. 2165–2175. Eleven sheets of studies for the mosaics of "Isaiah" and other Prophets at St. Paul's.

No. 2176. Study for Angels of the Passion at St. Paul's (alternative design to that of the Prophets).

No. 2177. Study for figures in "Conversion of Saul" in a project for the decoration of the dome of St. Paul's.

No. 2178. Studies for a group in the "Brazen Serpent" for the dome of St. Paul's.

No. 2179. Studies for "The Fall" in the dome of St. Paul's.

No. 2180. Study for "Cowardice" in the Wellington Monument, St. Paul's.

No. 2181. Studies for supporting figures in the Dorchester House chimney-piece.

No. 2182. Studies for the chimney-piece and for a carved door at Dorchester House.

No. 2183. Studies for a figure holding a shield on the chimney-piece, for a carved door, and for painting on the cove of a ceiling at Dorchester House.

Nos. 2184–2189. Six sheets of studies for the picture of "King Alfred and his Mother," now in the Gallery of British Art.

No. 2190. Studies for the picture of "Parmigiano."

No. 2191. Studies for figures of "Una" and others from "The Faery Queen" for the decoration of a drawing-room in the house of Don Christobal de Murietta in Palace Gardens.

No. 2192. Studies for prize medals for the Science and Art Department, South Kensington, and for another subject.

No. 2193. A nude and a draped figure; subject at present not identified.

No. 2194. Studies for (?) Deposition.

No. 2195. Studies for (?) Deposition and (?) Entombment.

No. 2196. Studies for (?) Entombment, and for a group on the cove of a ceiling at Dorchester House.

No. 2197. A seated and a standing figure; subject at present not identified.

The above 33 sheets of studies, Nos. 2165–2197, were purchased for 87*l.* 2*s.* from Mr. W. W. Bagshawe, whose father acquired them at the sale after Stevens's death.

6. *Antwerp School.* "The Magdalen." A half-length portrait of a lady as St. Mary Magdalen. She wears a rich gold brocade dress edged at the neck and wrists with fur, and laced over a red bodice. Attached to the lacing is a large jewel of three stones with a pearl pendant. On her forehead is another jewel surrounded by eight pearls held in place by a black ribbon; another hangs round her neck. There is a ring with a single stone on the second joint of the third finger of left hand. This hand supports a gold repoussé vase, and the cover is held in place by her right hand, which has also a single-stone ring on the second joint of the first finger.

Wood, 8½ inches high by 6 inches wide, arched top.

Purchased from Mr. Thomas H. Mack for 30*l.*

Hung in the Gallery at Trafalgar Square, Room XI., No. 2163.

7. *Joseph Ducreux.* (1735–1802.) French School. "A portrait of the Artist." The artist, dressed as a French Abbé with powdered hair, looks straight out of the picture. He wears a white tie, a black coat, and partially unbuttoned waistcoat.

On canvas, 1 foot 9½ inches high by 1 foot 5¾ inches wide.

Purchased from Messrs. Shepherd Bros. for 50*l.*

Hung in the Gallery at Trafalgar Square, Room XVII., No. 2162.

(C. *Purchased out of the "Clarke Fund."*)

8. *Frank Huddlestone Potter.* (1845–1887.) British School. A lamplight scene. At a cottage piano, nearly facing the spectator, a child of 12 to 15 years,

seated to the right and facing left, is teaching a smaller child, perched on the piano stool. She indicates the notes on the sheet of music with a pointer; her left hand rests upon the keys. Her frock is pomegranate colour, that of the smaller child intense green, and both have reddish hair. The wall above the piano is green, broken by a gilt picture frame, and there are dark panels and screens right and left. To the right is also a small table with a blue vase on a citron-coloured cloth; on a stand to the left lies a Japanese doll. A small vase of flowers stands on the piano.

On panel, 1 foot 8 inches high by 2 feet 4½ inches wide.

On the back of the panel are two beginnings of studies and a chalk inscription, "A Music Lesson. By Frank H. Potter. Finished Jan., 1887" (four months before his death).

Purchased from Mr. Percy Thomas for 250*l*.

Hung in the Gallery of British Art, Room VI., No. 2108.

Appendix No. 2.

Bequests and Donations to the Gallery.

Bequeathed by Mrs. Bruce Gordon.

1. *Robert Home.* (Middle of the eighteenth century—about 1836.) British School. "Arthur Wellesley, First Duke of Wellington." A portrait of the Duke when in India. He is represented in uniform, with his right hand thrust into the breast of his scarlet tunic.

Canvas, 2 feet 5¼ inches high by 2 feet 1¼ inches wide.

Lent to the National Portrait Gallery, No. 2128.

Bequeathed by Mrs. Edwin Edwards.

2. *Henri Fantin Latour.* (1836–1904.) French School. "Roses." A handful of white roses and blue plumbago placed together in a glass jar which stands on a polished wood table seen against a brown background. Signed "Fantin, 1864."

Canvas, 1 foot 5 inches high by 1 foot 9 inches wide.

Hung in the Gallery at Trafalgar Square, Room XVII., No. 2133.

3. *Henri Fantin Latour.* (1836–1904.) French School. "Apples." A plate of four apples of different sorts and different degrees of ripeness. Signed "Fantin, '67."

Canvas, 1 foot 2 inches high by 1 foot 4 inches wide.

Hung in the Gallery at Trafalgar Square, Room XVII., No. 2134.

4. *Jean Baptiste Camille Corot.* (1796–1875.) French School. "The Marsh of Arleux-du-Nord." A dark grey cloud spreads over the flat land of the marsh and a piece of open water in the distance gleams with a pallid light. There is a broken row of trees on the left. Some rough lines in the foreground show that the artist intended to put in a boat with fishermen and nets on the left.

Canvas, 10½ inches high by 1 foot 10 inches wide.

Reproduced in "L'Œuvre de Corot," by A. Robaut. Paris, 1905, Vol. III., No. 2024, with the date 1871 (Juillet). It is there recorded that it was purchased by M. Fantin Latour at the posthumous sale of Corot's works, when it was numbered 470.

Hung in the Gallery at Trafalgar Square, Room XVII., No. 2135.

Bequeathed by Mr. Henry Callcott Brunning.

5. *James Stark.* (1794–1859.) British School. "Woody Landscape." A path starts from the middle of the foreground and turns towards the left into a clump of oak and birch trees. A woman, a boy, and a girl pass under the trees carrying firewood. To the left in the foreground is a pond, to the right a donkey with a foal, and behind these marshy country leads to low hills on the horizon. The sky is cloudy.

Canvas, 1 foot 8½ inches high by 2 feet 10 inches wide.

Hung in the Gallery of British Art Room II., No. 2164.

6. *Hendrick v. Steenwyck.* (1580–1648.) Flemish School. "An Interior of a Gothic Church." A view of the nave of a Gothic church looking towards the choir. The congregation is entering by a door on the right under an organ. A priest is holding a service at an altar placed against a black marble column on the right and the people kneel about him. Beggars importune some women in a black habit on the left, and two dogs play in the foreground. In the distance a funeral procession enters the choir.

Signed on the pillar to the right, "H. V. Steein, 1615."

Copper, 10 inches high by 1 foot 3½ inches wide.

Hung in the Gallery at Trafalgar Square, Room XI, No. 2204.

7. *Pieter Neeffs.* (1577–8—1657–61.) Flemish School. "An Interior of a late Classic Church." A night scene in a large church of Renaissance classic architecture, looking towards the dimly lit apse, with a large crucifix on the choir screen. The side chapels are also lighted. An acolyte is extinguishing the candles in a chapel on the right. In the foreground there is an elaborate metal font, raised on red marble steps, and on a tomb on the floor is an inscription :—

"632 Hier legt begraven Henri Steenwick."

Wood, 1 foot 6 inches high by 2 feet 1½ inches wide.

Hung in the Gallery at Trafalgar Square, Room XI, No. 2205.

8. *Pieter Neeffs.* (1577–8—1657–61.) Flemish School. "Vespers." An interior of a Gothic church at night. A priest is holding a service in a chapel to the left of the aisle at an altar over which is a picture framed in black and red marble, with three white marble statues on the pediment. The scene is lighted by the candles in the chapel, and their rays fall upon the people kneeling or passing by in the central aisle. An organ in a red case is seen high up on the wall to the right. At the foot of the wall is the signature, "Pieter Neefs."

Wood, 10½ inches high by 1 foot 2½ inches wide.

Hung in the Gallery at Trafalgar Square, Room XI, No. 2206.

9. *Pieter Neeffs.* (1577–8—1657–61.) Flemish School. "After Vespers." An interior of a chapel in a Gothic church at night. A boy is extinguishing the candles which light the scene. The people are leaving after the service. The chapel represented is the same as that on the left of No. 2206, the only difference being that there are no white marble statues on the pediment of the frame over the altar, and that the altar front has been changed.

Wood, 11 inches high by 8 inches wide.

Hung in the Gallery at Trafalgar Square, Room XI, No. 2207.

10. *Patrick Nasmyth.* (1787–1831.) British School. "A View in Sussex." A pond on a hilly common with a dead tree on the right. The Surrey hills are seen in the distance. Signed, "Patk. Nasmyth, 1820."

Wood, 1 foot 6 inches high by 2 feet wide.

Hung in the Gallery at Trafalgar Square, Room XXI., No. 2208.

Presented by Miss Clare Atwood, on behalf of a body of subscribers, in memory of Miss Ethel Parker.

11. *Hercules Brabazon Brabazon.* (1821–1906.) British School. "The Pink Palace." The foreground shows the mouth of a Venetian canal in shadow, with a mooring-post on either side. On the farther side of a canal crossing the first a palace front, broken by green shutters, faces the rosy evening light, and is reflected in the troubled waters. Painted about 1890.

Body colour on grey-green paper, 9½ inches high by 1 foot 1¾ inches wide.

Exhibited at the Goupil Gallery in 1892. Till 1907 in the possession of Prof. F. Brown.

Hung in the Gallery of British Art, Room VI., No. 2113.

12. *Hercules Brabazon Brabazon.* (1821–1906.) British School. "The Grand Canal." A view of the Grand Canal, Venice. One side of the canal sweeps round in brilliant light towards the left; from a landing-stage in shadow to the right gondolas are crossing. Painted about 1890.

Body colour on white paper, 5¾ inches high by 10¼ inches wide.

From Mrs. Harvey Combe's Collection.

Hung in the Gallery of British Art, Room VI., No. 2114.

13. *Alfred Stevens.* (1818–1875.) British School. "Studies." On one side of the sheet is a study in sanguine of a woman seated on the ground, nude to the waist, with arms outstretched to hold a child, who is stepping on her knee. The design, enclosed in a circle, is for one of the roundels intended to be carved in wood on the door panels of Dorchester House. Alongside is a second study for the legs of the child.

On the back are studies in pencil for other roundels in the same scheme.

From the Collection of Mr. Reuben Townroe, who bought it at the sale after Stevens's death.

12½ inches high, by 13 inches wide.

Gallery of British Art, No. 2198.

Presented by Mrs. Harvey Combe in memory of her uncle the Artist.

14. *Hercules Brabazon Brabazon.* (1821–1906.) British School. "Houses at Tivoli." A courtyard with partly dilapidated buildings, grey and ochreous in tint, to the right. Over the wall to the left is seen the distant plain. Grey-blue sky. Inscribed "H. B. B., Tivoli." Drawn about 1860.

Pencil and wash with body-colour on warm-grey paper, 10 inches high by 1 foot 2½ inches wide.

Hung in the Gallery of British Art, Room VI., No. 2109.

15. *Hercules Brabazon Brabazon.* (1821–1906.) British School. "Roses." A bunch of tea-roses, ranging in colour from pink to yellow, in a blue and white vase against a brown background. Signed "H. B. B." Painted about 1895.

Body-colour on paper, 1 foot 1¼ inches high by 9½ inches wide.

Hung in the Gallery of British Art, Room VI., No. 2110.

16. *Hercules Brabazon Brabazon.* (1821–1906.) British School. "Murcia." Market-place of the Spanish town in brilliant sunshine. A street opens between white buildings facing the spectator, and in this stands a ruddy-coloured tower. The sky is deep blue. Part of the foreground is in shadow; in the lighted part are trees, figures, and the tilt of a large wagon.

Body-colour on warm-grey paper, 6 inches high by 8½ inches wide.

Hung in the Gallery of British Art, Room VI., No. 2111.

17. *Hercules Brabazon Brabazon.* (1821–1906.) British School. "Tivoli." The town is seen on its height to the left against a warm evening sky. The river bed is below to the right, with the plain beyond, and the cascades are seen on the hill-side under the town. The colour is sober tints of brown and green. The date is about 1868.

Transparent watercolour, with touches of opaque white, on white paper, 5½ inches high by 1 foot wide.

Hung in the Gallery of British Art, Room VI., No. 2112.

Presented by Mr. J. S. Sargent, R.A.

18. *Hercules Brabazon Brabazon.* (1821–1906.) British School. "Les Rochers Rouges." A bay and promontory in warm evening light, on the coast between Nice and Mentone. The sand in the foreground is in shadow. The title is written on the mount in pencil in the artist's hand.

Body-colour on grey paper, 6½ inches high by 9⅛ inches wide.

Hung in the Gallery of British Art, Room VI., No. 2115.

Presented in commemoration of the Exhibition of Jewish Art and Antiquities held at the Whitechapel Art Gallery in 1906, *by Mr. Jacob Moser, J.P., of Bradford, through the Trustees of that gallery represented by Canon Barnett and Sir Edgar Speyer, Bart., and a special committee represented by the Very Rev. Dr. Gaster, the Haham of the Spanish and Portuguese Jews.*

19. *William Rothenstein.* British School. "Jews Mourning in a Synagogue." The scene is a small Russian "schul" or synagogue. Seven men, two of them standing, the rest seated, and facing three-quarters to the right, are grouped against the grey-washed wall of the room. They are mourning for the death of their "Rav" or Rabbi. They are draped in the customary "talith" or praying-shawl, with its stripes of white and blue-black. To the left hangs a curtain, embroidered in red and gold.

On canvas, 4 feet 1 inch high by 3 feet 8½ inches wide.

Exhibited at the New English Art Club in the summer of 1906, and in the autumn of the same year at the Jewish Exhibition in Whitechapel.

Hung in the Gallery of British Art, Room VI., No. 2116.

Presented by His Honour Judge Evans.

20. *Alphonse Legros.* British School. "Portrait of Mr. John Gray." Life size head in profile to left; collar of shirt and coat just indicated, the rest of the grey-tinted canvas being left untouched. Mr. John Gray was the donor of a Museum and Art School to the town of Aberdeen. At the time this project was taking shape, October, 1883, Mr. Legros, at that time Slade Professor in London, was on a visit to his friend, M. Camille des Clayes, and was induced to give a demonstration of painting in a public hall such as he was in the habit of giving to his pupils at the Slade School. This portrait-study was the result, and was painted in the space of an hour and a quarter. (*See* the "Aberdeen Free Press" of October 15th, 1883.)

Signed, "A. Legros, 1883."

On canvas, 2 feet ½ inch high, by 1 foot 5½ inches wide.

Hung in the Gallery of British Art, Room VI., No. 2117.

Presented by Mr. John Maddocks, J.P.

21. *James Charles.* (1851–1906.) British School. "Will it Rain?" An old woman in black bonnet, lilac apron, and cream-coloured and scarlet shawl stands, basket on arm, in front of her cottage in the village street. With puckered face she looks at the sky, and hesitates to open her green umbrella. The cream and scarlet of her shawl are echoed in the comb and feathers of a cock, in the plaster of the cottage and geraniums and fuchsias in its window. Signed "J. Charles, 1887."

On canvas, 1 foot 5½ inches high by 1 foot 1½ inches wide.

Hung in the Gallery of British Art, Room VI., No. 2119.

Presented by Mrs. James Charles, Widow of the Artist.

22. *James Charles.* (1851–1906.) British School. "Heads and Groups of Figures."

Pencil on white paper.

Hung in the Gallery of British Art, East corridor, No. 2124.

23. *James Charles.* (1851–1906.) British School. "Landscape and Figures." Two landscape notes, the second of a Mill; a girl reading, and note of a group.

Pencil on white paper.

Hung in the Gallery of British Art, East corridor, No. 2125.

24. *James Charles.* (1851–1906.) British School. "A Country Road."

Pencil on white paper.

Hung in the Gallery of British Art, East corridor, No. 2126.

Presented by Prof. Frederick Brown.

25. James Charles. (1851–1906.) British School. "Studies of Sheep."

Pencil on white paper.

Hung in the Gallery of British Art, East Corridor, No. 2122.

26. *James Charles.* (1851–1906.) British School. "In the Hayfield." Field with haycart and stacks. Above are separate sketches of haycart.

Pencil on white paper.

Hung in the Gallery of British Art, East corridor, No. 2123.

Presented by a Body of Subscribers.

27. *William Holman Hunt.* British School. "The Ship."

"I hear the noise about thy keel,
I hear the bell struck in the night.
I see the cabin window bright,
I see the sailor at the wheel."

Tennyson—*In Memoriam.*

The scene is the deck, at night, of a P. and O. steamer in the Mediterranean. The sky is deep blue, with stars and a moon in her first quarter. Contrasted with this is a rush of red sparks from the funnel. In the foreground, right, a sailor, with his back to the spectator, stands at the wheel. Beyond him a canvas awning stretches over a boom from side to side. Against the bulwarks to the right a passenger stands holding his cap on with one hand and a field glass in the other. To the left a lady is seated, looking up at the stars; a kitten rubs itself against her skirts. From the "cabin window bright" in the centre a hand passes a key

to a lascar who crouches outside. Farther away two passengers, a man and a woman, are seated amidships. The picture was painted in 1875, when the artist was on his way to Syria, at a time when the old-fashioned steering gear, a wheel at the stern, still persisted. "It was evident that this opportunity of illustrating Tennyson's lines could not be postponed. The artist, therefore, made drawings and night studies of effect, and on his arrival in Syria, with the scene still fresh in his mind, he painted this picture." (Catalogue of exhibition at Leicester Galleries, 1906.) Signed with monogram, and dated.

On canvas, 2 feet 5½ inches high by 3 feet 1¾ inches wide.

Hung in the Gallery of British Art, Room III., No. 2120.

Presented by Mr. John R. Clayton.

28. *Alfred Stevens.* (1818–1875.) British School. "Studies for 'Isaiah.'"? A sheet of studies in sanguine and pencil for the general arrangement and for the angel to the left in the mosaic of "Isaiah" at St. Paul's, the full-size cartoon for which hangs in this Gallery.

10 inches high by 12¼ inches wide.

Hung in the Gallery of British Art, Room X., No. 2121.

Presented by Mr. George Salting.

29. *Giovanni Francesco da Rimini.* Italian School. "Madonna and Child." The Madonna supports the naked child who is standing on the edge of a parapet. He grasps the thumb of her right hand in his. She wears a red dress and a blue mantle lined with green, clasped at the throat with a pearl and ruby brooch and a white linen head-dress pushed up over her temple but covering her ears. Two angels look over the top of a semi-circular recess with a red cornice that forms the background. The figures are half the size of life. Signed on the parapet, Joyanes Franciscus Rimino. Fecit, MCCCCVI.

Wood, 2 feet 1 inch high by 1 feet 6⅜ inches wide.

Hung in the Gallery at Trafalgar Square, Room VI., No. 2118.

Presented by Mrs. Charles L. Eastlake, in memory of her Husband, for 20 years Keeper of the National Gallery.

30. Dutch School. 16th century. "Ulricus Sirosenius, Duke of East Friesland." A portrait of a man in armour with a large broad-brimmed black hat worn very much on one side. There is a small medallion on the brim bearing the device of an eagle. Under his hat he wears a skull cap covered with network. At each of the intersections of the gold strings of which it is made is a single small pearl. He carries a sword over his right shoulder, inscribed on the blade—"Victor est qui nomen Domini pugnavit."

On oak, 1 foot 6 inches high by 1 foot 1 inch wide.

On the back of the oak panel is written "Ulricus Sirosenius Frisia Orientalis Primus." There is a similar portrait of this Duke of Friesland in the Oldenburg Gallery, attributed to Lucas Van Leyden, but Dr. Wilhelm Bode, in his text to the illustrated publication of the Oldenburg Gallery, says it is more probably by Jacob Cornelissen. There is a version in the Collection of the Duke of Rutland, with Durer's monogram and the date 1520 illustrated in the Catalogue of the Guildhall Exhibition of 1892. A third version is at Dijon.

Hung in the Gallery at Trafalgar Square, Room XI., No. 2209.

Presented by Mr. J. P. Heseltine.

31. *Jan Siberechts.* (1627–1703.) Flemish School. "The Water Lane." A market cart, loaded with vegetables and driven by a boy in a red jacket riding on a grey horse, splashes through a water lane shaded by oaks and willows. An old woman in a conical straw hat rides in the cart. A girl in a white cap is wading through the water driving four cows along the lane in the opposite direction. Two magpies are seen in the trees.

Canvas, 2 feet 1¾ inches high by 1 foot 9¼ inches wide.

Hung in the Gallery at Trafalgar Square, Room XII., No. 2130.

Presented by Sir J. C. Robinson, C.B., through the National Art Collections Fund.

32. *Sir David Wilkie, R.A.* (1785–1841.) British School. "A Pic-nic." A park scene, with figures grouped to right on the bank of a river which shows to left of foreground. This little picture appears to have been a holiday work of Wilkie's,

painted at the same time as a small panel in the Vernon Collection ("A Woody Landscape" No. 330). It represents the friends with whom he was staying at the time, Mr. and Mrs. Nursey, of Grove, Little Bealings, Woodbridge, and their children, on an excursion to the grounds of Sir Philip Brooke on the Orwell. A label on the back calls it "A sketch for the picture of the Nursey Family," but no larger picture of the subject appears to be known. This little picture had escaped the notice of writers on Wilkie, and the connection of the Vernon picture with it was revealed by a faint pencil inscription on the back of the former to the effect that it was given to Mr. Nursey as a souvenir of the visit. The date was July 1822. (See a letter in Cunningham's "Life," Vol. II., p. 81.) Wilkie's attempts in landscape pure and simple were few. He speaks of his "Sheepwashing," (1816) as the first, and he exhibited no other.

On panel, 17 inches high, by 10 inches wide.

Originally purchased by Sir Charles Robinson from the son of Mr. Nursey.

Hung in the Gallery of British Art, Room I., No. 2131.

Presented by Mr. J. J. Duveen, jun., and other Members of the National Art Collections Fund.

33. *Alfred Stevens.* (1818–1875.) British School. "Portrait of John Morris Moore." Head and shoulders, three-quarter face to left. Long chestnut hair, moustache and beard; armour indicated. Reddish ground. The subject of the portrait was the well-known connoisseur, whose acquaintance Stevens made in his early days at Florence. It was painted in Rome, in the year 1840, when Stevens was 22. In the previous year he had spent some time in Venice, copying Titian and other masters of the Venetian School, and the influence of those studies is strongly marked in the portrait. Stevens, till his return to England, appears to have looked forward to painting as his chief work; but he was unsuccessful in obtaining commissions, and this is one of less than a dozen portraits he is known to have painted. It appeared in public for the first time at the Old Masters Exhibition of 1901.

On canvas, 1 foot 11 inches high by 1 foot 6½ inches wide.

Purchased by the National Art Collections Fund from Mr. John Morris Moore, jun.

Hung in the Gallery of British Art, Room III., No. 2132.

Presented by the Comtesse de Coullanges.

34. *Augustin de Saint-Aubin.* (1736–1807.) French School. "Jean Baptiste Lulli." A print of Lulli, the composer, engraved from a drawing by C. M. Cochin, after the bust by Colignon. This portrait is to be compared with the portrait of Lulli in the picture by Hyacinthe Rigaud, representing Lulli and his fellow-musicians at the French Court, purchased from the Comtesse de Coullanges in the year 1906 for the sum of 2,000*l.*

7 inches high by 5 inches wide.

Hung in the Gallery at Trafalgar Square, in the East Octagon Room, No. 2136.

Presented by Mr. Henry J. Pfunget, F.S.A.

35. *Jacob Ochtervelt.* (16 — before 1710.) Dutch School. "A Lady standing at a Spinet." A lady in a rose-coloured satin dress stands in front of a spinet, touching the keys with her left hand. A gentleman in a full-bottomed wig sits at the other side of the instrument, lifting his right hand as if in remonstrance. A dog turns to the right towards a page-boy, who is entering the door of the room carrying a flask of wine.

On canvas, 2 feet 7 inches high by 2 feet 1⅛ inches wide.

Hung in the Gallery at Trafalgar Square, Room XII., No. 2143.

Presented by Mrs. Bywater.

36. A water-colour copy of "The Virgin and Child," by Domenico Veneziano, numbered 1215 in the National Gallery.

Hung in one of the lower rooms at Trafalgar Square.

Presented by Mr. J. F. Waggett.

37. Two oval plinths of black marble, measuring respectively 8½ inches and 6½ inches high, and both of them 19 inches and 11 inches across.

Placed in the Gallery of British Art.

Presented by Mr. J. Duveen.

38. A carved French frame for the picture by Hyacinthe Rigaud of "Lulli and the Musicians of the French Court," No. 2081, in the National Gallery.

Presented by the Misses Sharpe.

39. *Thomas Stothard, R.A.* (1755–1834.) British School. "Peace came down upon the Earth." A maiden in white, with an olive branch in her hand, is being led forward by cupids and by a woman in red, bearing a cuirass on a pole. On the right a family and personifications of Art and Plenty watch her progress rejoicing.

Canvas, 1 foot 8 inches high by 2 feet 6 inches wide.

This picture was painted for Mr. Samuel Rogers as a companion to No. 279, "The Horrors of War," by Rubens.

Presented by Mr. H. Finch.

40. *John Frederick Lewis, R.A.* (1805–1876.) British School. Five studies in pencil and water-colour on tinted paper:—

Portrait of Mehemet Ali Pasha.

1 foot 3 inches high by 1 foot 9½ inches wide. No. 2199.

Two turbaned figures seated on the ground in an Eastern courtyard (? Cairo).

1 foot high by 10 inches wide. No. 2200.

Corridor leading to sacristy of Santa Croce, Florence. The view is looking towards the church, and shows the walls hung with pictures.

Inscribed "Santa Croce, July 28."

8¼ inches high by 11¼ inches wide. No. 2201.

Interior of a small domed building in Moorish style, with view through arched openings.

Inscribed in left corner "Mirador in Sanchez' Cottage," and in right corner "Alhambra."

8¼ inches high by 11 inches wide. No. 2202.

The interior of a church.

7 inches high by 10¼ inches wide. No. 2203.

Presented by Mr. A. E. Anderson.

41. *Thomas Gainsborough, R.A.* (1727–1788.) British School. "The Watering Place." Cattle are drinking at a watering place in a sandy hollow, surrounded by trees. A similar composition to Nos. 109 and 1174 in the Gallery at Trafalgar Square. A print from a soft ground etching reinforced with aquatint. This work is said to have been engraved on pewter.

9¾ inches high by 1 foot 1 inch wide.

Hung in the Gallery at Trafalgar Square, in the West Octagon Room, No. 2210.

The following works of art were purchased for the nation by the President and Council of the Royal Academy of Arts under the terms of the Chantrey Bequest:—

Leonard Campbell Taylor. British School. "The Rehearsal." Two ladies and three men, engaged in playing a quintet, are grouped about a grand piano. They are dressed in early Victorian style, and seated in a blue-carpeted room with greyish walls splashed with evening sunlight.

Canvas, 7 feet high by 10 feet wide.

Lent to the Walker Art Gallery, Liverpool.

Arthur Friedenson. British School. "Runswick Bay." A view on a sunny day in winter, through morning haze, of the little Yorkshire fishing village and line of coast looking northward. In the foreground are a woman and child feeding hens.

Canvas, 3 feet 4 inches high by 5 feet wide.

Lent to the Royal Society of Artists, Birmingham.

William George Simmonds. British School. "The Seeds of Love." A youth, wearing tunic and hood, scatters seed in the furrows of a field bordered by tree stems, among whose roots grow primroses. Crows hover and alight behind him. Leaning against a tree with her back to the sower is a young shepherdess with crook, and beyond her a field with a flock of sheep.

Water colour, 1 foot 9½ inches high by 1 foot 4 inches wide.

Hung in the Gallery of British Art, Room XVII., No. 2139.

Bertram Mackennal. British School. "The Earth and the Elements." Four nude female figures encircle a block of marble, in which they are partly engaged.

White marble on white onyx circular base.

Height, including base, 2 feet 4½ inches. Base, 3¼ inches.

Placed in the Gallery of British Art, Room XIV., No. 2140.

Siegfried Makepeace Wiens. British School. "Girl and Lizard." A girl, lying on a rock, peers over the edge at a lizard, attached to the wooden base.

Bronze on wooden base, 12¼ inches high by 1 foot 8¼ inches wide. Base, 6½ inches high.

Placed in the Gallery of British Art, Room XIV., No. 2141.

Appendix No. 3.

Loans to the Gallery.

Lent by Mr. J. C. J. Drucker.

1. *Jacob Maris.* (1838–1899.) Dutch School. "Mother and Child." A lady in a black dress and a white apron is seated in an armchair nursing her child. On a table to the right there are some roses in a glass vase. Signed "J. Maris, f. 1868."

Wood, 11 inches high by 9 inches wide.

Hung in the Gallery at Trafalgar Square, Room XII.

2. *Jacob Maris.* (1838–1899.) Dutch School. "The Drawbridge." A horse and cart are crossing a white wooden drawbridge over a canal in a Dutch town. Signed "J. Maris."

Wood, 1 foot high by 9 inches wide.

Hung in the Gallery at Trafalgar Square, Room XII.

3. *Anton Mauve.* (1838–1888.) Dutch School. "Watering Horses." A boy, with blue sleeves, riding a black horse and leading a grey horse by a halter, has brought them to a shallow pool in a meadow to drink. In the distance on the left is an irregular row of willows. Signed "A. Mauve."

Canvas, 1 foot 2 inches high by 1 foot 11 inches wide.

Hung in the Gallery at Trafalgar Square, Room XII.

4. *Johannes Bosboom.* (1817–1891.) Dutch School. "The Interior of Haarlem Church." An interior of a simple Gothic church with a nave and one aisle. A gleam of sunshine lights up the west wall, and a gentleman in a red cloak and black hat walks up the nave. Signed "J. Bosboom."

Wood, 9¾ inches high by 1 foot 1 inch wide.

Hung in the Gallery at Trafalgar Square, Room XII.

5. *Josef Israels.* Dutch School. "The Philosopher." An old man is seated at a table writing by the light of a single candle. Signed "Josef Israels."

Canvas, 2 feet 1 inch high by 1 foot 9 inches wide.

Hung in the Gallery at Trafalgar Square, Room XII.

6. *Eugène Louis Gabriel Isabey.* (1804–1886.) French School. "Grandfather's Birthday." In a richly furnished room a young lady and an old lady are bringing three gaily dressed children to congratulate an old gentleman who is seated at a table with a white cloth. Signed "E. Isabey, '66."

Wood, 9 inches high by 11 inches wide.

Hung in the Gallery at Trafalgar Square, Room XII.

7. *Eugène Louis Gabriel Isabey.* (1804–1886.) French School. "Fish Market, Dieppe." A wooden stall covered with fish forms the principal light of the picture. A customer is bargaining with an old fishwife. There is a distant view of houses through the wooden beams supporting the low roof of the market house. Signed "E. Isabey, '45."

Wood, 1 foot 2 inches high by 1 foot 8½ inches wide.

Hung in the Gallery at Trafalgar Square, Room XII.

Lent by the Victoria and Albert Museum.

8. *Lo Fil de Mestre Rodrigo.* (15th century.) Spanish School. "The Adoration of the Magi." The Madonna, in a red robe and white cloak lined with green, is seated on a stone plinth, part of a ruined building which forms the background. Behind her stands St. Joseph dressed in green. She supports the naked Child on her knees. He raises His right hand blessing the three Magi who are bringing their gifts in golden cups. The foremost has placed his crown at the feet of Christ, and kneels in adoration. Inscribed "Lo Fil de Mestre Rodrigo."

Wood, 5 feet 8 inches high by 4 feet 10¾ inches wide.

Hung in the Gallery at Trafalgar Square, Room XIV.

Lent by Sir Hickman Bacon, Bart.

9. *Adrian Brouwer.* (1605 ?–1638.) Dutch School. "A Tavern Scene." Some boors are drinking round a fire and laughing at a man who is teasing a woman, who pulls his hair in revenge. An angry old woman looks at them through a window. Signed "Brouwer."

Wood, 1 foot 7¼ inches high by 2 feet 5½ inches wide.

Hung in the Gallery at Trafalgar Square, Room XIII.

Lent by Sir George Donaldson.

10. *Ambrogio de Predis.* (14 ?–15 ?.) Milanese School. "A Portrait of Bona of Savoy." A profile portrait of a lady in a rich dress of red brocade with puffed sleeves and a cloak of wide stripes of different colours. She wears strings of pearls and coral on her head-dress and round her neck. Dark background.

Canvas, 4 feet 6 inches high by 2 feet wide.

Hung in the Gallery at Trafalgar Square, Room IV.

Lent by Mr. George Salting.

11. *The Master of Jehan Perreal.* French School. "St. Clement and Donor." The Saint, in Papal crown and full canonicals, holds an anchor in his left hand, and places his right on the shoulder of the donor, who wears a dark dress and folds his hands in prayer. A river flowing past the walls of a fortified town forms the background, and a white-robed angel with folded hands hovers in the blue sky.

Wood, 1 foot 7 inches high by 1 foot 2½ inches wide.

Hung in the Gallery at Trafalgar Square, Room XVI.

12. *The Maître de Flémalle.* French School. "The Virgin and Child." The Madonna, in a long-flowing white robe, supporting the Divine Child in her arms, is standing in a semi-circular apse. Angels on either side play on the lute and the harp.

Wood, 1 foot 10 inches high by 1 foot 5 inches wide.

Hung in the Gallery at Trafalgar Square, Room XVI.

13. *Jean Baptiste Camille Corot.* (1796–1875). French School. "The Leaning Tree" (*L'arbre penché*). A group of willows and silver birches on the side of a lake. The tree on the left bends over the water, where a man is working in a punt. A woman is pulling creepers from a willow trunk, and another woman with a basket is sitting on the ground. Signed "Corot."

Canvas, 1 foot 7 inches high by 1 foot 11½ inches wide.

Hung in the Gallery at Trafalgar Square, Room XVII.

14. *Jean Baptiste Camille Corot.* (1796–1875.) French School. "The Wood Gatherer" (*La ramasseuse de bois*) A woman is gathering wood in a glade on an upland near a lake. A town on a hill in the distance. Signed "Corot."

Canvas, 1 foot 6½ inches high by 2 feet 1 inch wide.

Hung in the Gallery at Trafalgar Square, Room XVII.

15. *Jean Baptiste Camille Corot.* (1796-1875.) French School. "Evening on the Lake." A figure in a red cap is wading out to a boat anchored off a rocky headland, behind which the sun is setting. Signed "Corot."

Wood, 9½ inches high by 12½ inches wide.

Hung in the Gallery at Trafalgar Square, Room XVII.

16. *Jean Baptiste Camille Corot.* (1796–1875.) French School. "Noon." A country cart is following a rough track across some fields to a farm. Willow trees on the left. Signed "Corot."

Canvas, 10 inches high by 1 foot 1½ inches wide.

Hung in the Gallery at Trafalgar Square, Room XVII.

17. *Narcisse Virgile Diaz de la Peña.* (1809–1876.) French School. "The Storm" (*L'orage*). A gleam of light from a sky covered with racing rain clouds falls on a pathway over a rough common, across which hurries a sportsman followed by two dogs. Signed "N. Diaz, '71."

Canvas, 2 feet high by 2 feet 6 inches wide.

Hung in the Gallery at Trafalgar Square, Room XVII.

18. *Charles François Daubigny.* (1817–1878.) French School. "Willows and Fishers" (*Les saules et les pêcheurs*). The sun is setting behind a group of trees on the banks of a river. The reflection of its last rays are seen through the brown tree-trunks. On the left a child and a woman are fishing. Signed "Daubigny, 1874."

Canvas, 1 foot 9½ inches high by 2 feet 7 inches wide.

Hung in the Gallery at Trafalgar Square, Room XVII.

Appendix No. 4.

Number of Visitors to the Gallery in Trafalgar Square, and the Gallery of British Art at Millbank on Public Days, exclusive of Sundays, during 1907.

Month.	Number of Days.	National Gallery in Trafalgar Square.	Number of Days.	National Gallery of British Art at Millbank.
January - -	18	30,914	17	17,200
February -	16	33,689	16	17,588
March - -	17	35,534	17	24,160
April - -	18	61,285	17	33,402
May - -	17	53,160	18	29,191
June - -	17	48,068	17	26,659
July - -	19	63,653	17	25,526
August - -	17	75,110	19	37,610
September -	17	53,573	17	28,453
October - -	18	45,980	17	22,040
November -	17	30,248	18	17,231
December -	17	36,445	17	13,756
Total -	208	567,659	207	292,816

Daily Average at Trafalgar Square - - 2,733

„ „ Millbank - - 1,414

Appendix No. 5.

Return of Number of Catalogues Sold during the Year.

		£ s d.
Foreign Schools:		
Catalogues, at 1s. each - - - - - -	1,268	63 8 –
Foreign Schools (Abridged Edition):		
Catalogues, at 6*d.* each - - - - - -	3,332	83 6 –
British School:		
Catalogues, at 6*d.* each - - - - - -	5,138	128 9 –
Cassell's Illustrated:		
Catalogues at 6*d.* each - - - - - -	381	9 10 6
Gallery of British Art:		
Official Catalogues, at 6*d.* each - - - -	13,262	331 11 –
Cassell's Illustrated:		
Catalogues at 6*d.* each - - - - - -	365	9 2 6
Total - - -	23,746	£625 7 –

NATIONAL PORTRAIT GALLERY.

FIFTY-FIRST ANNUAL REPORT

OF THE

TRUSTEES OF THE NATIONAL PORTRAIT GALLERY.

1907-1908.

Presented to both Houses of Parliament by Command of His Majesty.

LONDON:
PRINTED FOR HIS MAJESTY'S STATIONERY OFFICE,
By DARLING & SON, Ltd., 34-40, Bacon Street, E.

And to be purchased, either directly or through any Bookseller, from
WYMAN and SONS, Ltd., Fetter Lane, E.C., and
32, Abingdon Street, Westminster, S.W.; or
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E. PONSONBY, 116, Grafton Street, Dublin.

1908.

[Cd. 4124.] *Price* 1½*d.*

FIFTY-FIRST ANNUAL REPORT

OF THE

TRUSTEES OF THE NATIONAL PORTRAIT GALLERY.

1907-1908.

TO THE LORDS COMMISSIONERS OF HIS MAJESTY'S TREASURY.

THE TRUSTEES of the National Portrait Gallery have the honour to submit herewith, to the Lords Commissioners of His Majesty's Treasury, their Fifty-first Annual Report for the year ending 31st March, 1908.

Since the date of their last Report, May, 1907, the number of meetings held by the Trustees is five, and from the 9th February, 1857, when the Trustees commenced their duties, 275.

The Annual Inspection of the Gallery by the Board of Trustees took place on Thursday, May 16th, 1907.

The Board has sustained a loss through the death on September 13th, 1907, of Henry Hucks, first Lord Aldenham. Nominated a Trustee on November 18th, 1890, as Mr. Henry Hucks Gibbs, M.P. for the City of London, and created a peer on January 31st, 1896, Lord Aldenham had been a constant attendant at the meetings of the Board, and retained an active interest in its proceedings up to the date of his death at the advanced age of eighty-eight.

The vacancy on the Board caused by the death of Lord Aldenham had not been filled at the date of this Report.

The Board of Trustees is therefore at present constituted as follows, the names being given in order of seniority of appointment:—

Chairman—The Viscount Peel.
Vice-Chairman—The Viscount Dillon.

Trustees Ex-Officio—

The Lord President of the Council (for the time being).
The President of the Royal Academy of Arts (for the time being).

Sir Coutts Lindsay, Bart.
The Lord Ronald Sutherland Gower.
The Lord Fitzmaurice.
The Viscount Cobham.
The Lord Weardale.
The Lord Ribblesdale.
The Viscount Knutsford, G.C.M.G.
The Lord Balcarres, M.P.
The Earl Percy, M.P.
Sir William Reynell Anson, Bart., M.P.
Sir Thomas David Gibson-Carmichael, Bart.

700 Wt 6245 6/08 D & S 27 32552

The difficulties caused by the want of space in the exhibition galleries continue to increase. Newly acquired portraits, or portraits displaced to make way for new acquisitions, have to be placed in positions ill-suited to the proper exhibition of paintings.

On 10th July, 1907, some alarm and inconvenience to the National Portrait Gallery was caused by a slight outbreak of fire in the guard-room of St. George's Barracks, immediately contiguous to the Gallery. In consequence of the anxiety caused by this incident, the Lord Weardale, a Trustee of the Gallery, put the following question, on behalf of the Chairman and Board of Trustees, to His Majesty's Government, in the House of Lords, on 8th August, 1907 :—

> " Whether His Majesty's Government are aware of the grave fire and other risks to which " the National Portrait Gallery is exposed by reason of the close proximity of the canteen " and prison belonging to St. George's Barracks, and whether they will take steps, as in the " case of the National Gallery, to isolate the National Portrait Gallery by the transference of " these buildings to some other position in the area occupied by the Barracks; and whether " His Majesty's Government will, in the event of a decision to remove the Barracks to some " other locality, have due regard to the allocation of the vacant space to the claims of the " National Portrait Gallery, and the urgent necessity for some increase in the accommodation " provided for the National Collection of Portraits."

To this the Earl of Portsmouth, Under Secretary of State for War, replied that a new site for St. George's Barracks had been selected by His Majesty's Government in Old Scotland Yard, and that the recruiting authorities at the War Office were willing to vacate St. George's Barracks when the new buildings were ready.

In answer to a further question by the Lord Weardale, the Lord Allendale replied on behalf of the First Commissioner of Works that, when the military buildings for recruiting purposes were provided in Old Scotland Yard, there would be facilities for an extension of the existing buildings of the National Portrait Gallery.

This statement has since been corroborated by the First Commissioner of His Majesty's Works in the Public Offices Sites (Extension) Bill, recently introduced in the House of Commons, and now engaging the attention of Parliament.

The Trustees of the National Portrait Gallery beg leave to express their hope that the proposed extension of the Gallery will be carried out with as little delay as possible as soon as the site may be vacant.

The list of 800 donations, loans, or bequests, as given in the former Reports, may now be continued, according to the following list, up to 817.

801. Arthur Phillip, R.N. 1738—1814. *Painted in* 1786 *by Francis Wheatley, R.A.*

Vice-Admiral and first Governor of New South Wales. Landing at Botany Bay in 1788 he established the first convict settlement in Australia, and afterwards proceeded to Port Jackson, where he founded the city of Sydney, now capital of the colony of New South Wales.

Bequeathed by Mrs. Elizabeth Gayton, and accepted by the Trustees, May 1907. 35¼ ins. × 27¼ ins. Register Number 1462.

802. Henry Purcell. 1658?—1695. *Attributed to John Closterman.*

Eminent musical composer. Organist of Westminster Abbey and of the Chapel Royal. Presented, May 1907, by Charles Burney, Esq. 21¼ ins. × 17¼ ins. Register Number 1463.

803. Rev. Rowland Hill. 1744—1833.
804. Sir Richard Hill, Bart. 1732—1808. } *Crayon drawings by John Russell, R.A.*

The Rev. Rowland Hill, the eminent preacher at the Surrey Chapel, which was erected for him in 1783, took a prominent part in the religious and philanthropic movements of his time.

Sir Richard Hill, brother of the Rev. Rowland Hill, was M.P. for Shropshire, 1780—1806, and noted for his religious and controversial writings.

Presented, May 1907, by Sir Edwin Durning-Lawrence, Bart. 12¼ ins. × 9⅝ ins. each. Register Numbers 1464 and 1465.

805. John Frederick Lewis, R.A. 1805—1876. *Painted (unfinished) in* 1832 *by Sir William Boxall, R.A.*

Eminent painter. President of the Royal Water Colour Society.

Presented, July 1907, in accordance with the instructions of his widow. 18 ins. × 31¾ ins. Register Number 1470.

806. Arthur Wellesley, first Duke of Wellington, K.G. 1769—1852. *Painted in India by Robert Home.*

Deposited on loan, July 1907, by the Trustees and Director of the National Gallery. 29½ ins. × 24½ ins. Register Number 1471.

807. SYDNEY SMITH. 1771—1845. *Painted by Henry Perronet Briggs, R.A.*

Celebrated essayist, humourist, and divine. Canon residentiary of St. Paul's Cathedral.
Presented, July 1907, by Henry, first Viscount Knutsford, G.C.M.G., a Trustee of the Gallery. 49½ ins. × 39½ ins. Register Number 1475.

808. SAMUEL SHARPE. 1788—1881. *Painted in* 1868 *by his daughter, Matilda Sharpe.*

Translator of the Bible and Egyptologist.
Presented, July 1907, by the artist and her sister, Miss Emily Sharpe. 23½ ins. × 19¼ ins. Register Number 1476.

809. JOSEPH BONOMI. 1796—1878. *Painted in* 1868 *by Matilda Sharpe.*

Sculptor, hieroglyphic draughtsman and curator of the Soane Museum.
Presented, July 1907, by the artist and her sister, Miss Emily Sharpe. 19½ ins. × 15½ ins. Register Number 1477.

810 SIR WILLIAM ROBERT GROVE, P.C., F.R.S., D.C.L., LL.D., 1811—1896. *Painted (posthumous) by Helen Donald-Smith.*

Man of science and judge. Author of 'The Correlation of Physical Forces.' Judge of the Court of Common Pleas, 1871, and Justice of the High Court of Justice in the Queen's Bench Division, 1875.
Presented, July 1907, by his son, Major General Sir Coleridge Grove, K.C.B. 24 ins. × 20 ins. Register Number 1478.

811. CHARLES GEORGE GORDON, C.B., R.E. 1835—1885. *Pencil-drawing, sketched in* 1882 *just before he left for Palestine, by Edward Clifford.*

Major-General. Governor General of the Soudan. Killed at Khartum.
Presented, November 1907, by the artist's brother, Alfred, Lord Bishop of Lucknow. 25½ ins. × 20½ ins. Register Number 1479. (*See* also page 6.)

812. JOSEPH MALLORD WILLIAM TURNER, R.A. 1775—1851. *Pencil-drawing, sketched at the British Institution by Charles Martin.*

Famous landscape-painter.
Presented, November 1907, by Miss Alice Balfour. 13¾ ins. × 9½ ins. Register Number 1483.

813. SIR CHRISTOPHER WRAY. 1524—1592. *An old copy from a contemporary original, painter unknown.*

Judge. Speaker of the House of Commons, 1571; Justice, 1572, and Chief Justice, 1574, of the Queen's Bench, and as such presided over the trial of Mary Queen of Scots.
Bequeathed by Mr. William T. Snosswell, and accepted by the Trustees, January 1908. 24 ins. × 19 ins. Register Number 1484.

814. JOHN PALMER. 1742?—1798. *Painted by Angelica Kauffmann, R.A.*

Eminent actor. Created the part of 'Joseph Surface' in the first performance of Sheridan's 'School for Scandal,' 1777. Died on the stage at the Liverpool Theatre while playing in 'The Stranger.'
Presented, January 1908, by Charles Davis, Esq., M.V.O. 29 ins. × 24 ins. Register Number 1485.

815. OLIVER CROMWELL. 1599—1658. *Electrotype from a rare medal by Thomas Simon.*

Presented January 1908, by M. W. Fawcus, Esq. Register Number 1486.

816. SIR WILLIAM JAMES LLOYD WHARTON, K.C.B., F.R.S. 1843—1905. *Painted (posthumous) by Harry Allen.*

Rear-Admiral. Hydrographer of the Royal Navy, 1884—1904.
Presented March 1908, by a body of subscribers to the 'Wharton Testimonial Fund.' 29½ ins. × 25½ ins. Register Number 1497.
In this case the usual rule as to the expiration of ten years from the date of decease was waived by the Trustees in consideration of the national importance of the services rendered by Sir William Wharton to shipping and navigation.

817. CHARLES SOMERSET, EARL OF WORCESTER, K.G. 1460?—1526.

Ambassador and statesman. Chamberlain to Henry VII., by whom and Henry VIII. he was employed on important embassies. 7 ins. × 5⅜ ins. Register Number 1492.

SIR NICHOLAS THROCKMORTON. 1515—1571.

Diplomatist and statesman. Took an important part in political affairs during the reigns of Edward VI., Queen Mary I., and Queen Elizabeth. 6⅜ ins. × 5⅛ ins. Register Number 1492A.

SIR WILLIAM DRURY. 1527—1579.

Marshal of Berwick, 1564—1576, President of Munster, 1576—1578, and Lord Justice to the Council in Ireland, 1578. 6 ins. × 5⅛ ins. Register Number 1492B.

Three water-colour drawings by George Perfect Harding, being copies after original paintings of the period.
Bequeathed by Mr. H. C. Brunning, and accepted by the Trustees, January 1908.

The number of purchases was stated in the previous Report to amount to 719. It may now be continued up to 738 :—

720. Richard Talbot, Duke of Tyrconnell, P.C. 1630—1691. *Attributed to Hyacinthe Rigaud.*

Viceroy of Ireland. Commanded the army of James II. in Ireland, and was created successively Earl (1685) and Duke (1689) of Tyrconnell. In 1687 he was appointed Viceroy, and after the defeat of King James at the Boyne, was nominated by him in 1691 Lord Lieutenant and Commander in Chief in Ireland.

Purchased by the Trustees, May 1907. 45½ ins. × 35 ins. Register Number 1466.

721. Count Anthony Hamilton, P.C. 1646 ?—1720. *Painter uncertain.*

Soldier and author. Brother of Elizabeth, Comtesse de Grammont and Sir George Count Hamilton. He held a command in King James's Irish Army, but after the battle of the Boyne in 1690 retired to the court of France, where he led a literary life. He is most widely known as the author of 'Mémoires du Comte de Grammont.'

Purchased by the Trustees, May 1907. (Oval) 28½ ins. × 24 ins. Register Number 1467.

722. Sir George, Count Hamilton. Died 1667. *Painter uncertain.*

Brother of Count Anthony Hamilton. Page to Charles II. when in exile, and afterwards an officer of the Horse Guards. He entered the body-guard of Louis XIV. by whom he was created a count and maréchal du camp, but was killed in action at Saverne the same year.

Purchased, with number 1467, by the Trustees, May 1907. (Oval) 28½ ins. × 24 ins. Register Number 1468.

723. John Clare. 1793—1864. *Painted by William Hilton, R.A.*

The Northamptonshire poet. Author of 'Poems, descriptive of Rural Life and Scenery,' 1821; 'The Village Minstrel and other Poems,' 1821; 'The Shepherd's Calendar,' 1827, and other works.

Purchased by the Trustees, May 1907. 29½ ins. × 24½ ins. Register Number 1469.

724. Thomas Osborne, First Duke of Leeds, K.G. 1631—1712. *Painted in* 1689 *as Marquess of Carmarthen, and attributed to Sir Godfrey Kneller.*

Statesman. Lord High Treasurer, 1674. As Earl of Danby he took a prominent part in the Revolution and was created Marquess of Carmarthen, 1689, and Duke of Leeds, 1694.

Purchased by the Trustees, July 1907. 93 ins. × 57 ins. Register Number 1472.

725. John Hookham Frere. 1769—1846. *Drawn by Henry Edridge, A.R.A.*

Diplomatist and author. Ambassador at Madrid in 1808 at the time of Napoleon's advance. Noted especially as a translator of Aristophanes.

Purchased by the Trustees, July 1875. 15 ins. × 10¼ ins. Register Number 1473.

726. Charles George Gordon, C.B., R.E. 1835—1885. *Painted at Cairo in January,* 1884, *by Leo Diet, being the last portrait taken before his journey to Khartum.* (*See* ante page 5.)

Purchased by the Trustees, July 1907. 20 ins. × 15 ins. Register Number 1474.

727. Sir Henry Parkes, G.C.M.G. 1815—1896. *Drawn in pencil in* 1891 *by Julien R. Ashton.*

Australian Statesman. Born in Warwickshire. In 1839 he emigrated to Australia where he obtained employment first as a farm-labourer. Later he became a journalist, and taking a conspicuous part in politics eventually rose in 1871 to be Prime Minister of New South Wales. Created G.C.M.G., 1888. Died at Sydney.

Purchased by the Trustees, November 1907. (Oval) 12 ins. × 9¾ ins. Register Number 1480.

728. Sir Matthew Wood, Bart. 1768—1843. *Painted by Arthur William Devis.*

Twice Lord Mayor of London, and M.P. for the City of London, 1816–1843. He supported the cause of Queen Caroline, and was created a baronet by Queen Victoria, the first title conferred by the Queen after her accession. His second son became Lord Chancellor as Baron Hatherley.

Purchased by the Trustees, November 1907. 29½ ins. × 24¼ ins. Register Number 1481.

729. Sir Henry Wotton. 1568–1639. *Painter uncertain.*

Diplomatist and author. He lived for a time at Venice as an agent in foreign affairs, and there wrote 'The State of Christendom,' and was afterwards appointed as Ambassador to Venice by James I. Provost of Eton College from 1623 till his death. A collection of his writings and poems was published under the title 'Reliquiæ Wottonianæ,' 1651.

Purchased by the Trustees, November 1907. 48 ins. × 38 ins. Register Number 1482.

Similar to a portrait at Eton College.

730. George John, Second Earl Spencer, K.G. 1758–1834. *Painted by John Singleton Copley, R.A.*

Statesman. During his tenure of office as First Lord of the Admiralty, 1794–1801, he considerably improved naval administration, and the famous battles of St. Vincent, Camperdown, and the Nile were won. He formed the celebrated Althorp Library, and was first President of the Roxburghe Club.

Purchased by the Trustees, January 1908. 29 ins. × 24 ins. Register Number 1487.

731. MARGARET BEAUFORT, COUNTESS OF RICHMOND AND DERBY. 1441—1509. *An early painting on panel, probably fifteenth century, artist uncertain.*

Mother of Henry VII. Founder of St. John's College, and Christ's College, Cambridge, and established professorships of divinity at that University as well as at Oxford.

Purchased by the Trustees, January 1908. 17 ins. × 12 ins. Register Number 1488.

732. PHILIP HERBERT, FIRST EARL OF MONTGOMERY AND FOURTH EARL OF PEMBROKE, K.G. 1584—1650. *Painted by William Dobson.*

Lord Chamberlain to Charles I. He was a favourite of James I. and created Earl of Montgomery in 1605, and K.G. in 1608. He continued in favour with Charles I. and succeeded his brother as Lord Chamberlain in 1626 and as fourth Earl of Pembroke in 1630. He became alienated from the royal cause, and, transferring himself to the Parliamentary opposition with which he had much influence, was removed from office. Buried in Salisbury Cathedral.

Purchased by the Trustees, January 1908. 20¾ ins. × 17 ins. Register Number 1489.

733. LANCELOT BROWN. 1715—1783. *Painted by Nathaniel Dance, R.A.*

Landscape-gardener and architect. He gained great reputation for the introduction of landscape effects into gardens as opposed to the more formal style. Sometimes known as 'Capability' Brown.

Purchased by the Trustees, January 1908. (Oval) 29 ins. × 24 ins. Register Number 1490.

734. SIR WILLIAM GELL, F.R.S., F.S.A. 1777—1836. *Pencil-drawing by Thomas Uwins, R.A.*

Traveller, archæologist, and author of several works on classical topography.

Purchased by the Trustees, January 1908. 7¾ ins. × 6½ ins. Register Number 1491.

735. HENRY ST. JOHN, FIRST VISCOUNT BOLINGBROKE. 1678—1751. *Sketch in oils by Sir Godfrey Kneller.*

The celebrated statesman, diplomatist, writer and patron of literature.

Purchased by the Trustees, February 1908. 22½ ins. × 19 ins. Register Number 1493.

736. ABIGAIL HILL, BARONESS MASHAM. Died 1734. *Painted by Sir Godfrey Kneller.*

Favourite of Queen Anne. First cousin of Sarah, Duchess of Marlborough, through whose patronage she was appointed bedchamber-woman to Queen Anne. Appointed Keeper of the Privy Purse on the dismissal of the Duchess of Marlborough in 1711, when her husband, Samuel Masham, groom of the bedchamber to Prince George of Denmark, Prince-Consort of Queen Anne, was created a peer.

Purchased by the Trustees, March 1908. (Oval) 28 ins. × 21 ins. Register Number 1494.

737. GEORGE CRABBE. 1754—1832. *Painted by Henry William Pickersgill, R.A.*

Poet and divine. He was a prolific writer of essays and verse, and author of 'The Library,' 1781, 'The Village,' 1783, 'Tales of the Hall,' 1819, etc.

Purchased by the Trustees, March 1908. 29½ ins. × 24½ ins. Register Number 1495.

738. CUTHBERT, BARON COLLINGWOOD. 1715—1810. *Painted (posthumous) by Henry Howard, R.A.*

Vice-Admiral and celebrated naval commander. Fought with distinction at the victories of the First of June, 1794, and off Cape St. Vincent, 1797. He served under Nelson as second in command at the battle of Trafalgar, 21st October 1805, and succeeded at Nelson's death to the command of the fleet at the close of this famous action. Raised to the peerage for his services. Buried in St. Paul's Cathedral.

Purchased by the Trustees, March 1908. 49 ins. × 39 ins. Register Number 1496.

The following engravings, photographs, etc. (among others) have been presented for the Reference Portfolios :—

Mrs. Orchard, photograph from a painting by T. Gainsborough, R.A.
Miss Morrison, photograph from a painting by Sir Joshua Reynolds, P.R.A.
Presented, May 1907, by J. H. M. Kirkwood, Esq.

T. P. Andrews, after Sir Joshua Reynolds, P.R.A.
Lady Rumbold, after Sir Joshua Reynolds, P.R.A.
Sir T. Rumbold and his son, after T. Gainsborough, R.A.
Dr. Law, Bishop of Carlisle, after George Romney.
Four photographs, presented July 1907, by Algernon Graves, Esq., F.S.A.

Sir John Comyns, died 1740, Chief Baron of the Exchequer.
Photogravure, presented July 1907, by Mr. Frederick Turner.

Lieut.-Gen. Sir James Hills-Johnes, G.C.B., V.C. Photograph from the painting by Frank Nowlan of the action of July 9th, 1857.
Presented, July 1907, by the artist.

Rev. Richard Baxter, 1615—1691. Engraving by G. Vertue.
Presented, November 1907, by Charles E. Baxter, Esq.

Francis Bacon, Viscount St. Albans, 1561—1626. Photograph from a portrait by P. Van Somer.
Presented, January 1908, by Madame Belloc.

George Gordon, Lord Byron, 1788—1824. Engraving by S. Freeman after a silhouette cut by Mrs. Leigh Hunt.
Presented, January 1908, by W. Bright Morris, Esq.

Set of half-tone illustrations of portraits reproduced in 'No. 10, Downing Street, Whitehall,' by Charles Eyre Pascoe.
Presented, January 1908, by the author.

Set of portrait-illustrations to Miss Robbins's 'Life of Lord Macartney.'
Presented, January 1908, by A. H. Hallam Murray, Esq.

Sir Thomas Gresham, 1519?—1578. Two large framed photographs from
(*a*) a whole-length painting attributed to Holbein,
(*b*) a half-length painting by Antonio Moro, both in the Mercers' Hall.
Presented, March 1908, by the Worshipful Company of Mercers.

George Bryan Brummell, 1778—1840. Photograph from a drawing by Sir David Wilkie, R.A.
Presented, March 1908, by A. Forbes-Sieveking, Esq., F.S.A.

The following engravings and photographs (among others) have been purchased for the Reference Portfolios :—

Three portfolios containing 234 photogravures from portraits of celebrities, published by the Berlin Photographic Company.

Fifty-four 'Vanity Fair' cartoons, required to complete the series of portraits published by 'Vanity Fair.'

The following books, pamphlets, etc. have been presented to the Reference Library :—

'Raleghana,' parts VII and VIII, by Dr. T. N. Brushfield, F.S.A.
Presented, May 1907, by the author.

'Medallic Illustrations of the History of Great Britain and Ireland,' plates LXI–LXX.
Presented, January 1908, by the Trustees of the British Museum.

The large group of the 'Convention of the Anti-Slavery Society, 1840,' painted by Benjamin Robert Haydon, has been successfully laid down on panel, cleaned and varnished by Messrs. White, Allom & Co. It has been refitted in its frame and placed under glass.

Glass has also been provided for the two large whole-length portraits of John Philip Kemble and Mrs. Siddons, painted by Sir Thomas Lawrence, P.R.A., and for all those framed portraits acquired since the issue of the last Report and now placed on exhibition in the Galleries.

The Trustees are pleased to be able to report that with the glazing of these pictures the work of placing under glass the whole collection of framed portraits has now been completed with the single exception of a perspective portrait of Edward VI., painted on panel, which for optical reasons cannot be thus protected.

In addition, the above-mentioned portraits have had their frames put in order or replaced by new ones as required, and new descriptive tablets have been written for them. Several old tablets have been rewritten or revised as needed. A great number of the old tablets still require revision, but this work has been postponed from year to year through lack of sufficient funds for this purpose. Two new autograph show-cases have been made and cloth covers provided for all show-cases in the exhibition galleries. Three new pedestals for busts have also been made.

The following painted portraits have been cleaned, restored, or repaired since the issue of the last Report :—

R. Cumberland (800).
C. J. Fox (801).
Sir D. Brewster (802).
John Clare (1469).
Rev. S. Smith (1475).
General Gordon (1474).
Sir C. Wray (1484).
Earl Spencer (1487).
} Lined, cleaned, and varnished.

Lord Melbourne (941).	Repaired and varnished.
Joshua Kirby (1421).	
Duke of Leeds (1482).	
Miss Strickland (403).	
J. Baskerville (1394).	
Lord Holland (382).	
Sir N. Bacon (164).	Cleaned and varnished.
Viscount Bolingbroke (1493).	
Duke of Buckingham (279).	
T. Burnet (526).	
W. Camden (528).	
Queen Catherine of Braganza (353).	
Charles II. (153).	
C. Churchill (162).	
Viscount Cobham (286).	
Earl of Craven (270).	
Lord Crewe (656).	
Countess of Cumberland (415).	
William Dobson (302).	
Elizabeth, Queen of Bohemia (511).	
W. Etty, R.A. (1368).	
Earl of Exeter (567).	
Frederick V. King of Bohemia (950).	
James Gibbs (504).	
Sir T. Gresham (352).	
Count Anthony Hamilton (1467).	
Sir George, Count Hamilton (1468).	
Lord Hopton (494).	
Lord Jeffreys (56).	
James II. (366).	
James Edward Stuart (348).	
J. P. Kemble (694).	
T. Killigrew (892).	
Bishop King (657).	
J. F. Lewis, R.A. (1470).	
John Locke (114).	
Duchess of Marlborough (712).	
Archbishop Matthew (1048).	
C. Middleton (626).	
Sir Isaac Newton (558).	
Mrs. Oldfield (431).	
Duke of Ormonde (78).	
Earl of Ossory (371).	
John Palmer (1485).	
Countess of Richmond and Derby (1488).	
Earl of Sandwich (182).	
J. Selden (76).	
Mrs. Siddons (698).	
Lord Somers (490).	
Sir R. Steele (160).	
Sir W. Temple (152).	
Lord Vere of Tilbury (818).	
Isaac Watts (264).	
Sir B. Whitelock (254).	
Sir C. Hanbury Williams (383).	
Sir R. Winwood (40).	
Sir M. Wood (1481).	
Sir H. Wotton (1482).	
Sir C. Wren (113).	
Sir T. Wyat (1035).	
Anne Duchess of York (241).	

The number of portraits on the register in the collection is now 1497, exclusive of engravings, photographs, and other portraits of a supplementary nature, which bring the total number of portraits actually exhibited to 1669.

LOAN OF PORTRAITS.

Since the opening of the new building in 1896, in order to relieve the congested state of the Galleries, fifty-three portraits, mostly duplicates of persons represented in the Gallery by better portraits, have now been transferred on loan to various public offices and collections with the approval of the Lords Commissioners of His Majesty's Treasury.

The following portrait was transferred on loan in April, 1907, with the consent of the Lords Commissioners of His Majesty's Treasury, to the Scottish National Portrait Gallery, Edinburgh.

SIR CHARLES LYELL, Bart., F.R.S., 1797—1875; the eminent geologist, *drawn in chalks by George Richmond, R.A.*; purchased by the Trustees, July 1896. Register Number 1064.

ESTABLISHMENT.

James White, appointed Attendant on April 1st, 1896, died on December 3rd, 1907.

James Richard Sansom, appointed a Pensioner-Messenger 9th September, 1901, was promoted to be Attendant, 1st January, 1908, in the place of James White, deceased.

Charles Herbert Flynn, Army Pensioner, was appointed a Pensioner-Messenger, 27th January, 1908, *vice* J. R. Sansom promoted.

STUDENTS.

The number of Students who have applied for Students' Tickets during the past year is 53, and 65 Students have had their tickets renewed.

One hundred and twenty copies have been made during the past year by students and copyists from portraits in the collection.

OFFICIAL CATALOGUE.

A new edition (the thirteenth) of 3,000 copies of the official catalogue was published in October 1907.

PHOTOGRAPHY.

The special arrangement made with Mr. Emery Walker (originally Messrs. Walker & Boutall) with regard to the sale of photographs in the gallery has been renewed by the Trustees for a further period up to March 31st, 1909.

Eighty-eight portraits have been photographed, by special permission, since the issue of the last Report.

SUNDAY OPENING.

The National Portrait Gallery was open on Sunday afternoons during the summer months from 2.30 to 5.30 p.m., commencing on April 7th, and for the last time on October 27th. During the winter months, from November to March inclusive, the amount of daylight after 3 p.m. is insufficient and too uncertain for the National Portrait Gallery to be opened to the public on Sunday afternoons.

The arrangements for the staff on Sunday afternoons remain as stated in the 39th Report (1895–6).

The total number of visitors admitted on Sunday afternoons was 11,727, giving an average of 391 per Sunday.

ATTENDANCE OF VISITORS.

The number of visitors to the National Portrait Gallery during the year 1907 amounted to 155,372.

The total is made up as follows:—

Visitors admitted free of charge	133,826
Visitors admitted on payment of sixpence	9,819
Visitors admitted on Sunday afternoons	11,727
	155,372

For the three months, January 1st to March 31st, 1908, the total number of visitors was 26,599, of which number 1,570 were admitted on payment of sixpence.

The total number of visitors admitted to the National Portrait Gallery since the opening of the new building in St. Martin's Place, on April 4th, 1896, to the 31st March, 1908, is 1,814,994.

The number of visitors to the Gallery from the commencement, in Great George Street, Westminster, to September, 1885 (when the pictures were removed to Bethnal Green), is shown by the following table :—

Year.	Visitors.	Year.	Visitors.
1859	5,305	1873	60,047
1860	6,392	1874	65,201
1861	10,907	1875	71,740
1862 (Exhibition year)	17,927	1876 (Exhibition of Scientific Instruments, and the Prince of Wales's Indian Presents).	108,252
1863	10,475	1877	79,987
1864	14,885	1878	72,105
1865	16,642	1879 (closed for alterations in the spring months).	64,034
1866	24,666	1880	76,109
1867	24,649	1881	84,532
1868	25,344	1882	84,599
1869 (not opened at Christmas) ...	24,757	1883 (International Fisheries Exhibition).	146,187
1870 (opened in March at South Kensington).	58,913	1884 (International Health Exhibition).	120,716
1871	63,195	1885 (International Inventions Exhibition). Closed in September for removal.	88,760
1872	67,039		
Grand total, September, 1885, at South Kensington	1,493,365		

At Bethnal Green Museum there existed no means of distinguishing those who came expressly to study portraits from general visitors to other departments.

The following table shows the number of visitors to the Gallery since the opening of the new building in St. Martin's Place :—

Year.	Month.	Number of Visitors admitted on Sunday Afternoons.	Number of Visitors admitted free on Week Days.	Number of Visitors admitted on payment of Sixpence.	Total.
1896	April to December	11,624	187,986	14,490	214,100
1897	January to December	13,683	139,416	8,957	162,056
1898	„ „	9,845	108,135	6,992	124,972
1899	„ „	11,839	103,284	7,080	122,167
1900	„ „	10,614	110,045	7,229	127,888
1901	„ „	8,057	104,342	7,178	119,577
1902	„ „	12,528	130,583	8,241	151,352
1903	„ „	11,368	120,303	9,016	144,687
1904	„ „	11,015	125,047	8,681	144,743
1905	„ „	13,411	145,843	9,515	168,769
1906	January	—	10,002	535	10,537
	February	—	8,229	507	8,736
	March	—	10,065	714	10,779
	April	2,230	15,197	721	18,148
	May	1,277	9,989	807	12,073
	June	1,037	11,189	964	13,190
	July	1,562	11,972	1,003	14,537
	August	1,370	16,113	1,331	18,814
	September	1,939	13,219	1,034	16,192
	October	2,407	12,559	762	15,728
	November	—	7,092	822	7,914
	December	—	5,741	323	6,064
Total number of visitors admitted in 1906.		11,822	131,367	9,523	152,712
1907	January	—	8,320	662	8,982
	February	—	8,034	565	8,599
	March	—	10,211	516	10,727
	April	1,858	14,878	896	17,632
	May	1,470	12,364	958	14,792
	June	1,971	10,759	1,000	13,730
	July	1,401	13,745	1,064	16,210
	August	1,471	17,800	1,466	20,737
	September	1,873	13,021	1,021	15,915
	October	1,683	10,517	772	12,972
	November	—	7,113	601	7,714
	December	—	7,064	298	7,362
Total number of visitors admitted in 1907.		11,727	133,826	9,819	155,372

Signed by order of the Board,

LIONEL CUST,

Director, Keeper, and Secretary.

National Portrait Gallery,
St. Martin's Place, W.C.
21st May, 1908.

NATIONAL GALLERY, IRELAND.

REPORT

OF

THE DIRECTOR

TO THE

BOARD OF GOVERNORS AND GUARDIANS

FOR THE YEAR 1907.

Presented to Parliament by Command of His Majesty.

DUBLIN:
PRINTED FOR HIS MAJESTY'S STATIONERY OFFICE,
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NATIONAL GALLERY, IRELAND.

DIRECTOR'S REPORT FOR 1907.

National Gallery of Ireland,

15*th July*, 1908.

My Lords and Gentlemen,

I have the honour to submit my Report for the year 1907.

During the year the following Pictures, Drawings, Engravings, etc., were purchased for the Collection :—

(*a.*) For the General Collection:—

	£	*s.*	*d.*
Portrait by C. Janssen,	120	0	0
Portrait of C. Pellegrini, by J. Bastien Lepage,	199	10	0
Portrait by John Downman,	21	0	0
Landscape by Augustus N. Burke, R.H.A.,	15	15	0
Drawing, Rye Harbour, by Walter Osborne, R.H.A.,	5	0	0
Drawing by J. R. Cozens,	2	0	0

Collection of 23 Drawings, as follows:—

Two Landscapes, by G. Barret, junr.,	25 0 0
Prometheus, by James Barry, R.A.,	
A Peasant's Bed, by J. G. Wille,	
A Legend of St. Dominic, by Guercino,	
Design for a Ceiling, by F. Boucher,	
Joseph in Prison, by Nicolas Poussin,	
The Peasant and the Satyr, by Jacob Jordaens,	
The Adoration of the Kings, by „ „	
Design for a Book Illustration, by D. Maclise,	
Portrait of Sir Andrew Fountaine, by D. Maclise,	
Study of a Child, by C. Procacini,	
Sketch, by F. G. Casanova,	
The Holy Family, by Guercino,	
Virgin and Child, by „	
The Holy Family, by A. Burino,	
Susanna and the Elders, by P. P. Rubens,	
Study for part of the " Last Judgment," by P. P. Rubens,	
Death of Adonis, by Sir A. Van Dyck,	
A Pieta, by „ „	
A Child's Head, „ „	
Peasants and Cattle, by B. Castiglione,	

(*b.*) For the Historical and Portrait Gallery :—

	£	*s.*	*d.*
Portrait of Peg Woffington; oil picture by John Lewis, .	89	5	0
„ Jonathan Swift; drawing by Isaac Whood, . .	65	0	0
„ Horace Hone; miniature by Himself, . .	25	0	0
View of the Casino at Marino; drawing by J. Malton, . . .	7	7	0
Portrait of Archbishop Boulter; mezzotint by Thomas Beard, .			
„ Lord Baltimore, by A. Blooteling, . . .			
„ Earl of Harrington; mezzotint by J. Faber after J. Fayram.	6	10	0
Map of the City of Dublin, by John Rocque, . . .			
Portrait of Wm. Lingen; mezzotint by John Brooks, . .	1	6	0
„ Peg Woffington, by R. Purcell, . . .			
„ Jonathan Swift, by A. Vertue, . . .	4	0	0
„ Lord Newport, by A. Miller, . . .			
„ the Earl of Moira, by H. Landseer after Bartolozzi,	1	1	0
Coloured Print, caricature Portraits of Chief Justice Downs, Lord Chancellor Manners, and Chief Baron O'Grady, . .	0	7	6
View of College Green, coloured aquatint, after T. S. Roberts, .	10	0	0
View of Dublin, with the Four Courts, &c., coloured aquatint, .	7	10	0
Interior of the Irish House of Commons, photogravure, proof, after the Picture by F. Wheatley, with Key, . . .	2	2	0
Gold Medal, struck in 1753, to commemorate the rejection by the Irish House of Commons of an unpopular money Bill introduced by Government in that year, ...	9	0	0

The following Donations and Bequests were received :—

(*a.*) For the General Collection :—

Oil Picture, by P. Wouwermans.
Presented by Sir Edgar Vincent, K.C.M.G.

Oil Picture, "Pasturage," by Nathaniel Hone, R.H.A.
Presented by the Artist.

Oil Picture, by J. J. Horemans the Elder.
„ by J. J. Horemans the Younger.
Both presented by Hugh P. Lane, Esq

Twelve Portrait Medallions, in glass paste, by James Tassie.
Transferred on Loan by the Board of the National Gallery of Scotland.

Oil Picture, Landscape, by J. Inchbold.
Bequeathed by Wm. Graham Brooke, Esq.

Water Colour Drawing, by F. Goodall.
„ „ Lanza.
Both bequeathed by Lady Martin, of 81 *Merrion Square.*

Bronze Plaque, by the late R. Willis, Head Master of the Metropolitan School of Art, Dublin
Presented as a Memorial to him by his friends and pupils.

(*b.*) For the Historical and Portrait Gallery :—

Portrait of the Earl of Moira, a small half-length figure in coloured wax.
Presented by Robert Armstrong, Esq., of Edinburgh.

Marble Bust of Sir Thomas Wyse, K.C.B.
Presented by Miss Wyse.

A Series of Engraved Views of Dublin, &c.
Presented by E. MacDowel Cosgrave, M.D.

(*b.*) For the Historical and Portrait Gallery—*continued* :—

A trial proof and a touched proof of Sherwin's engraving of the Installation of the Knights of St. Patrick.
Presented by John Mulhall, Esq.

Portrait of John Mitchel; lithograph.
Presented by Mrs. John Martin.

Plaster Statuette of Sir Dominic Corrigan, Bart. by J. H. Foley, R.A.
Bequeathed by Lady Martin.

Book, "Irish Goldsmiths," by C. J. Jackson.
Presented by J. Ribton Garstin, Esq.

The following Pictures were surface-cleaned and varnished :—

No. 425. The Betrayal of Christ, by G. Honthorst.
„ 306. Portrait of Lord Gough, by J. Harwood.
„ 200. Portrait Group, by Angelica Kauffmann.

During the year tickets of admission to copy in the Gallery were issued to 3 persons —2 ladies and 1 gentleman. The total number of attendances by artists and students was 924.

On the 2nd June, when Lt.-Colonel Hopton Scott completed his fourth period of five years as a Governor and Guardian of the Gallery, in which he had always evinced a warm interest, Lady Butler was appointed in his place by warrant of the Lord Lieutenant.

I have the honour to be,

My Lords and Gentlemen,

Your obedient Servant,

(Signed) WALTER ARMSTRONG,
Director.

To
The Governors and Guardians
of the National Gallery of Ireland.

APPENDIX.

DESCRIPTION OF PICTURES ACQUIRED DURING THE YEAR.

1. Cornelis Janssen Van Ceulen (1593–1664). Dutch School.
   A half-length male figure, in an oval, 2 ft. 6 in. high, 2 ft. 1 in. wide.
   Purchased from Mr. A. H. Buttery, London.
   Numbered 584, and hung in Room No. XVII.

2. J. Bastien Lepage (1848–1884). French School.
   Portrait of Carlo Pellegrini, the caricaturist; a three-quarter-length figure; seated. 1 ft. 1 in. high, 9½ in. wide.
   Purchased from Messrs. Brown and Phillips, London.
   Numbered 583, and hung in Room No. XII.

3. Augustus N. Burke, R H A. (d. 1891).
   A view in Connemara, 15¼ in. high, 29½ in. wide.
   Purchased from Mr. J. W. Milne, London.
   Numbered 587, and hung in Room No. XIII.

4. John Lewis. British School.
   Portrait of Peg Woffington; a half-length in an oval; in grey cape trimmed with lace and grey hat with ribbons. Landscape background. This portrait was painted in Dublin in 1753, when the famous actress was acting in her native city at Smock Alley Theatre. Lewis, the artist, was at the time engaged as a scene painter at Smock Alley, and also painted portraits. This picture was engraved in mezzotint by Michael Jackson. 2 ft. 5 in. high, 2 ft. wide. Signed "J. Lewis, April, 1753."
   Purchased at Christie's, London
   Numbered 579, and hung in Portrait Gallery.

5. Philips Wouwerman (1619–1668). Dutch School.
   A group of Shepherds round a camp fire. On the left a white horse. An angel appearing in the clouds above. 1 ft 6½ in. high, 1 ft. 3¾ in. wide. On panel.
   Presented by Sir Edgar Vincent, K.C.M.G.
   Numbered 582, and hung in Room No. XVII.

6. Nathaniel Hone, R.H.A. (Living artist.)
   A View near Malahide, Co. Dublin; a large pasture field with cattle in the foreground. 2 ft. 9½ in. high, 4 ft. 2 in. wide.
   Presented by the Artist.
   Numbered 588, and hung in Room No. XIII.

7. Jan Jozef Horemans—the Elder (1682–1759). Flemish School.
   Interior of a kitchen, with figures round the fire; a dog snatching a cake from a plate held by a girl. 11¼ in. high, 9¼ in. wide.
   Presented by Mr. Hugh P. Lane.
   Numbered 589, and hung in Room No. XV.

8 Jan Jozef Horemans—the Younger (1714–?). Flemish School.
   An interior, with four figures seated round a table. 1ft. ¾ in. high, 1 ft. wide. The canvas bears the false signature of J. Chardin.
   Presented by Mr. Hugh P. Lane.
   Numbered 590, and hung in Room No. XV.

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NATIONAL GALLERY, &c., SCOTLAND.

FIRST REPORT

TO

THE SECRETARY FOR SCOTLAND

BY THE

BOARD OF TRUSTEES FOR THE NATIONAL GALLERIES OF SCOTLAND

AS TO THEIR

PROCEEDINGS IN REGARD TO THE GALLERIES AND OTHER ESTABLISHMENTS UNDER THEIR CHARGE FOR THE PERIOD FROM 1ST APRIL—THE DATE WHEN THE BOARD WAS ESTABLISHED—TO 31ST DECEMBER 1907.

Presented to both Houses of Parliament by Command of His Majesty.

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E. PONSONBY, 116 GRAFTON STREET, DUBLIN.

1908.

[Cd. 4160.] *Price ½d.*

First Report to the Secretary for Scotland by the Board of Trustees for the National Galleries of Scotland as to their proceedings in regard to the Galleries and other Establishments under their charge for the period from 1st April—the date when the Board was established—to 31st December 1907.

TO THE RIGHT HONOURABLE JOHN SINCLAIR, M.P.,
HIS MAJESTY'S SECRETARY FOR SCOTLAND.

In submitting their Report for the above period, the Board of Trustees, in order to preserve continuity with the Reports of the Board of Manufactures, have thought it desirable to preface it by giving the following account of the work of their predecessors between 30th September 1906—when they last reported—and 31st March 1907, viz. :—

THE BOARD OF MANUFACTURES.

(*From 30th September 1906 to 31st March 1907.*)

THE NATIONAL GALLERY.

The Free Admissions for half-year to 31st March 1907 were 20,272 ; by payment of Sixpence, 1033 ; visits of Copyists, 1280—total, 22,585 ; number of Copyists, 168 ; number of Ordinary Catalogues sold, 785 ; Illustrated Catalogues, 26.

The following Works of Art were added to the Collection :—

By Gift—

Water-Colours, entitled "On the Sands, Tangiers," and "Outside Cairo," by H. B. Brabazon. Both presented by Mrs. Harvey Combe.

Portrait in Oil of W. D. Ross, by Robert Brough, A.R.S.A. Presented by W. D. Ross, Esq.

SCHOOL OF ART, ROYAL INSTITUTION.

The number of individual Students enrolled for half-year to 31st March last—the date when the School was handed over to the Municipality—was 428.

The Grant paid by the Scotch Education Department for the year ended 31st July 1906 was £1,573 15s. 4d., and for the year ended 31st July 1907 the Grant was £1,694 0s. 5d.

THE SCOTTISH NATIONAL PORTRAIT GALLERY BUILDINGS.

The Free Admissions to the Scottish National Portrait Gallery and Museum of Antiquities for half-year were 6438 ; by payment of Sixpence, 275 ; visits of Copyists, 8—total, 6721 ; number of Portrait Gallery Catalogues sold, 32.

The decorative Portrait Statue of Dr. John Hunter was placed in its niche, thus completing the series of Portrait Statues on the exterior of the Buildings.

SCOTTISH NATIONAL PORTRAIT GALLERY.

The following Works were added to the Collection during the period :—

By Gift or Bequest—

Water-Colour Portrait of Patric Park, R.S.A., Sculptor, by Kenneth Macleay, R.S.A. Presented by Patric Park, Junior.

Oil Portrait of Andrew Betts Brown, Engineer and Inventor, by R. P. Bell, A.R.S.A. Presented by his family.

Black and White Wash Drawing of Allan Cunningham, Poet and Biographer, by J. J. Penston. Presented by W. Skeoch Cumming, Esq.

By Purchase—

Oil Portrait of John, Earl of Mar, Regent of Scotland, by an unknown artist.
Oil Portrait of Sir James Hope of Hopetoun, Lawyer and Lead Worker, by an unknown painter.
Oil Portrait of Mrs. Scott, mother of Sir Walter Scott, by George Watson, P.S.A.
Oil Portrait of Robert Stevenson, Lighthouse and Harbour Engineer, by John Syme, R.S.A.
Chalk Portrait of Professor Sir John Leslie, Mathematician and Natural Philosopher, by John Henning, H.R.S.A.

MUSEUM OF ANTIQUITIES.

The number of Objects of Antiquity added to the Museum for the half-year to 31st March has been 208 by donation and 14 by purchase, and the number of Volumes added to the Library has been 63 by donation and 18 by purchase.

DUNBLANE CATHEDRAL.

The admissions to the Cathedral for the period since it was opened to the public on 1st April 1893 to 30th September 1906 were . . .	72,229
For the six months to 31st March 1907, when the Cathedral was vested in H.M. Office of Works, the admissions were	572
The total number of persons admitted to the Cathedral since it was opened to the public in 1893 is .	72,801

REPORT BY BOARD OF TRUSTEES.

(*From 1st April to 31st December 1907.*)

The Trustees have to report as follows:—

1. THE NATIONAL GALLERY.

The admissions to the National Gallery for the period have been:—

Free admissions	60,265
(Of which 8115 were on Sundays.)	
By payment of sixpence	4,733
Visits of copyists	1,706
Total . .	66,704
Number of copyists	190

Number of catalogues sold:—

Ordinary catalogues	3,068
Illustrated do.	66
Total . .	3,134

The number of persons admitted to the Gallery since it was first opened in 1859 is 4,766,655.

The following Works of Art have been added to the Collection:—

By Gift—

Picture in Oil, entitled "A Cornfield near Wooler," by James Charles. Presented by Sir Thomas D. Gibson Carmichael, Bart.
Antique Marble Bust, "Head of Young Man," by unknown Greek sculptor. Presented by Sir Thomas D. Gibson Carmichael, Bart.
Picture in Oil, entitled "The Bowlers," by Sir George Harvey, P.R.S.A. Presented by Sir Donald Currie, K.C.M.G.

On Loan—

Picture in Oil, entitled "Portrait of a Young Man." Lent by A. W. Inglis, Esq.

By Purchase—

Picture in Oil, entitled "Gil Blas and the Bishop of Granada," by W. E. Lockhart, R.S.A.
Picture in Water-Colour, entitled "Moorish Procession," by Arthur Melville, A.R.S.A.
Picture in Oil, entitled "Christmas Eve," by Arthur Melville, A.R.S.A.
Picture in Oil, being the study for the picture entitled "John Knox Preaching," by Sir David Wilkie, R.A.

2. THE SCOTTISH NATIONAL PORTRAIT GALLERY BUILDINGS.

The admissions to the Scottish National Portrait Gallery Buildings and the Museum of Antiquities during the period of this Report were :—

Free admissions	5,189
(Of which 3,695 were to the Portrait Gallery on Sundays.)	
By payment of sixpence	193
Visits of copyists	10
Total	5,392
Number of catalogues sold	79

The total number of persons admitted to the Buildings since the opening of the temporary buildings in 1885 is 449,992.

3. SCOTTISH NATIONAL PORTRAIT GALLERY.

The following Works were added to the Collection :—

By Gift or Bequest—

Marble Bust of Sir Walter Scott, by Sir F. Chantrey, R.A.

By Purchase—

Portrait in Oil of William, Earl of Glencairn. Artist unknown.
Portrait, Water-Colour, of Prof. Dick, V.S. Artist unknown.
Portrait in Oil, George MacDonald, LL.D., by Miss C. S. Harrison.

On Loan—

Portrait in Chalk of Sir Charles Lyell, by G. Richmond, R.A.
Portrait in Oil of Sam Bough, R.S.A., by John Philip, R.A.

4. MUSEUM OF ANTIQUITIES.

The Council of the Society of Antiquaries have reported that the number of Objects of Antiquity added to the Museum from 31st March last to date has been 160 by donation and 64 by purchase, and the number of Volumes added to the Library has been 94 by donation and 28 by purchase.

5. THE TREATY OF UNION ANNUITY OF £2000.

The Order in regard to the application of this Annuity was issued on 27th November 1907, but the Trustees did not receive payment until 31st December, the close of their Report.

All of which is submitted by

THOS. D. GIBSON CARMICHAEL
(*Chairman*).
JAMES GUTHRIE.
JAMES P. GIBSON.
JOHN R. FINDLAY.
WILLIAM BILSLAND.
JAMES MURRAY.
JOHN STIRLING-MAXWELL.

NATIONAL PHYSICAL LABORATORY.

REPORT OF THE COMMITTEE

APPOINTED BY THE TREASURY TO INQUIRE GENERALLY

INTO THE WORK NOW PERFORMED AT THE

NATIONAL PHYSICAL LABORATORY,

TOGETHER WITH A

Treasury Minute, dated the 1st February, 1908, recording their Lordships' Approval of the recommendations contained in the Report of the majority of the Committee.

Presented to both Houses of Parliament by Command of His Majesty.

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1908.

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TREASURY MINUTE DATED 31ST DECEMBER, 1906.

The First Lord recommends to the Board that a Committee be appointed to inquire generally into the work now performed at the National Physical Laboratory, with special reference to:—

(i.) The character of the mechanical, physical, and chemical tests undertaken there;

(ii.) The possibility of their interfering unduly with the business of other agencies;

(iii.) The desirability of publishing the results of all such testing work;

and to report:—

(1) Whether having regard to the industrial interests of the country generally, and to those of private agencies, any change is desirable in the scope of the work of the Laboratory, and

(2) On what lines any further development of its business should proceed.

The First Lord further recommends that the Committee should consist of the following persons:—

THE RIGHT HONBLE. G. BALFOUR, *Chairman*,
SIR ANDREW NOBLE, BART., K.C.B., F.R.S.,
SIR J. WOLFE BARRY, K.C.B., F.R.S.,
MR. W. J. CROSSLEY, M.P., AND
MR. R. CHALMERS, C.B.

My Lords approve.

REPORT.

TO THE LORDS COMMISSIONERS OF HIS MAJESTY'S TREASURY.

MAY IT PLEASE YOUR LORDSHIPS,

In accordance with the instructions contained in your Lordships' Minute of the 31st December, 1906, we have proceeded to inquire generally into the work now performed at the National Physical Laboratory, with special reference to the character of the mechanical, physical and chemical tests undertaken there; the possibility of their interfering unduly with the business of other agencies; and the desirability of publishing the results of all such testing work.

We have now the honour to submit the following Report upon the questions mentioned in the Minute.

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1. With a view to elucidating fully the questions referred to us we have examined Dr. Glazebrook, the Director of the Laboratory, also Lord Rayleigh, Sir Arthur Rücker and other members of the Executive Committee, some of whom were also members of the original Treasury Committee which reported in 1898; and we have heard evidence from gentlemen professionally engaged in the work of chemical and mechanical testing, representing five private testing establishments in London and two in other parts of the kingdom, apart from the testing departments attached to most of the principal manufactories of iron and steel. We have also received evidence from representatives of the Institute of Chemistry and such important bodies as the Institution of Civil Engineers and the Iron and Steel Institute, which contribute largely to the funds of the Laboratory, and from manufacturers and others interested in the work of the Laboratory, including Mr. Haldane, Secretary of State for War, and the Superintendent of the Royal Arsenal at Woolwich. We have also referred to the Report of the Committee appointed in 1897 to consider the desirability of establishing a National Physical Laboratory, several of the members of which gave evidence before us. In addition, by the courtesy of the Director, we had an opportunity of visiting the Laboratory at Bushy House, Teddington, and inspecting the work carried on there.

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2. The establishment of the National Physical Laboratory was the outcome of a deputation of eminent scientific men which waited upon the late Lord Salisbury in 1897. The deputation urged that certain types of investigation have been recognised both in this country and abroad as lying outside the range of effort possible either to an individual or to the great teaching universities or colleges, viz.:—

(1) The observations of natural phenomena, the study of which must be prolonged through periods of time longer than the average duration of life;

(2) The testing and verification of instruments for physical investigation, and the preservation of standards for reference; and

(3) The systematic accurate determination of physical constants and of numerical data which may be useful either for scientific or industrial purposes.

In consequence of these representations a Committee was appointed by the Treasury in 1897 to consider the advisability of establishing a Laboratory for the purpose of carrying out the two latter of these objects. The Committee, which reported in 1898, summarised its recommendations in the following words:—

(1) That a public institution should be founded for standardising and verifying instruments, for testing materials, and for the determination of physical constants.

(2) That the institution should be established by extending the Kew Observatory in the Old Deer Park, Richmond, and that the scheme should include the improvement of the existing buildings, and the erection of new buildings at some distance from the present Observatory.

(3) That the Royal Society should be invited to control the proposed institution, and to nominate a Governing Body, on which commercial interests should be represented, the choice of members of such body not being confined to Fellows of the Society.

(4) That the Permanent Secretary of the Board of Trade should be an *ex-officio* member of the Governing Body; and that such body should be consulted by the Standards Office and the Electrical Standardising Department of the Board of Trade upon difficult questions that may arise from time to time, or as to proposed modifications or developments.

These recommendations were accepted generally by the Government, and an annual grant of £4,000 was promised, together with a special grant of £12,000 for building purposes. The management of the new Institution, while placed under the ultimate control of the Royal Society, was entrusted to a Governing Body, consisting of a General Board, nominated in part by the Royal Society and in part by certain important Institutions representing commercial interests, and of an Executive Committee similarly constituted.* It was eventually decided to establish the new Laboratory at Bushy House, Teddington, and additional grants for adaptation and installation, amounting to £7,000 in all, were made by the Government. The Laboratory was finally completed and opened in 1902. Recently the annual grant from public funds has been increased from £4,000 to £6,000 a year, and special building grants have been made. In addition to these grants, private subscriptions and donations, including those for special equipment, have amounted since 1901 to £20,539 in all, or an average of £3,423 a year, apart from gifts of equipment. This assistance has rendered possible a considerable extension of the buildings of the Laboratory and the installation of new and improved apparatus.

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3. We print as an Appendix to our Report statistics indicating the nature of the work hitherto carried on at the Laboratory.

The Observatory Department at Kew has continued the testing and verification of instruments of precision, such as watches, thermometers and barometers, previously carried out under the direction of the Kew Observatory Committee of the Royal Society. This work grew up naturally in response to a demand unsatisfied by any other means, and the evidence laid before us leads us heartily to endorse the opinion of the Committee of 1898 as to its value to both science and industry.

The magnetic work hitherto carried on at Kew is now being removed to the new Observatory established by the Government at Eskdalemuir, for the upkeep of which a special additional grant is annually made from public funds.

As regards the Physics and Engineering Departments of the Laboratory at Bushy House, it will be seen that the great bulk of the time of the staff is occupied in research and the maintenance of standards and in the installation of apparatus connected therewith (*vide* Appendix).

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ity.

4. The witnesses who appeared before us unanimously testified to the great value to the commercial community of the researches of the character undertaken at the Laboratory and the high efficiency with which they are carried out. We would refer, in particular, to the investigations into electrical and engineering questions undertaken in connection with the Engineering Standards Committee, the labours of which have, we understand, been very materially facilitated by the assistance afforded by the Laboratory (1444–8). Important researches are also being carried out, to quote further examples, into such matters as the physical qualities of different alloys,

* The Executive Committee consists at the present time of the following gentlemen:—The Right Honourable The Lord Rayleigh, O.M., President R.S., *President and Chairman*; Mr. A. B. Kempe, Treasurer R.S., *Treasurer*; Professor J. Larmor, Secretary R.S.; Mr. H. Llewellyn Smith, C.B., Permanent Secretary, Board of Trade; Sir W. de W. Abney, K.C.B., F.R.S.; Sir J. Wolfe Barry, K.C.B., F.R.S.; Mr. G. T. Beilby, F.R.S.; Professor H. L. Callendar, F.R.S.; Colonel Crompton, R.E., C.B.; Dr. F. Elgar, F.R.S.; Mr. R. Kaye Gray; Mr. R. A. Hadfield; Mr. D. Howard; Mr. W. H. Maw; Sir Andrew Noble, Bart., K.C.B., F.R.S.; Sir Arthur W. Rücker, F.R.S.

the effects of alternating stresses and of continued impact upon various metals, and the pressure of wind on surfaces—questions to which the Committee of 1898 drew special attention. Again, very valuable and much-needed work is being accomplished in connection with the standardisation of electric glow lamps. There is ample evidence that work of this kind supplies a long-felt want in this country and is already widely appreciated by manufacturers and scientists; and we have no doubt that its importance will meet with a steadily increasing recognition. The Laboratory has already conducted various investigations on behalf of manufacturers yielding results of general scientific interest, such, for example, as a research into the properties of gutta percha and balata, undertaken for the India Rubber Company of Silvertown (1570).

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5. We are of opinion that the work proper for a National Physical Laboratory to undertake was correctly laid down, so far as the main lines are concerned, by the Committee of 1898, and that this work should include not only physical research directly or indirectly bearing on industrial problems, and the standardisation and verification of instruments, but also—under proper restrictions—the testing of materials.

There are, however, two subsidiary points to which our attention is specially directed by your Lordships' Minute: namely, (1) the possibility that the mechanical, physical and chemical tests actually undertaken by the Laboratory may interfere unduly with private enterprise; (2) the desirability of publishing the results of all such testing work. We have taken a considerable amount of evidence on both these points, and on both of them a marked divergence of opinion has been disclosed.

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6. As regards undue interference with the business of other agencies, the controversy has in large measure turned upon the right interpretation of the Report of the Committee of 1898. In Paragraph 9 of that Report the Committee stated that "it would neither be necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories," and a little further on they give examples of such matters as would, in their opinion, "be proper for investigation at a public institution, as distinguished from the ordinary testing of materials used in commerce or in construction and machinery, which can be, and is now, efficiently conducted at private establishments." Witnesses, representing professional analysts and engineering testers, naturally point to these passages as showing that the work of testing samples of materials in order to ascertain whether they comply with a given specification was laid down by the Committee of 1898 as altogether outside the scope of the Laboratory's activities.

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On the other hand, in defence of the present practice of the Laboratory in undertaking such work, reference is made to other passages in Paragraph 9 of the Report, in which the Committee declare that "it would be of great benefit to trade if means were provided for the public testing of the quality of certain classes of materials" and, in particular, that they "desire to draw attention to the evidence that has been laid before them as to the difficulties arising in certain Government Departments in their dealings with contractors and others which might be overcome by the establishment of an independent testing authority." It is further pointed out that after the sentence already quoted (to the effect that it would neither be necessary or desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories) the Committee add: "but there are many special and important tests and investigations into the strength and behaviour of materials which might be conducted with great advantage at a laboratory such as is contemplated in the reference. As illustrations we may mention investigations into the behaviour of metals and other substances under continuous or alternating stresses, which investigations are not, so far as we know, conducted at the present time at any testing institution in this country, and which could only be undertaken with satisfactory and authoritative results at a public laboratory." The authorities of the Laboratory also rely, in justification of its undertaking the commercial testing of materials, upon various passages in the Report indicating that the Laboratory was intended to be the English analogue of the Physikalischtechnische Reichsanstalt and the Mechanischtechnische Versuchsanstalt in Germany, in which institutions the commercial testing of materials is carried out without restriction (see paragraphs 1, 13 and 18). It is further noted that in the four recommendations in which the Committee embodies its final conclusions, the testing of materials is expressly mentioned as one of the objects for which a public

laboratory should be founded, without any of the qualifications and limitations contained in Paragraph 9; and that the official letter authorising the establishment of the National Physical Laboratory states that "Her Majesty's Government are prepared to adopt generally the four conclusions of the Committee as set forth on Page 6 of the Report," similarly without qualification or limitation. One of the witnesses, Mr. Alexander Siemens, who was himself a member of the Committee of 1898 and has been a member of the Executive Committee of the Laboratory, appeared to hold that the terms of the Report would justify the Laboratory in accepting any testing work that might be offered to it, even work already well carried out in private establishments, so long as the person offering the work deliberately preferred to send it there rather than elsewhere (1548). Other representatives of the Laboratory, however, put forward a less extreme contention. Thus, Dr. Glazebrook quite candidly recognised that on this question the Report was not self-consistent (109). This inconsistency, he says, has been acknowledged from the commencement; and the Executive Committee were aware of the provisions in the Report relating to non-interference with the business of private agencies and tried to observe them "as far as possible, consistently with other statements in the Report" (112, 113). Similarly, Lord Rayleigh, when asked whether he considered that the practice of the Laboratory, especially with regard to the testing of materials, has, as a matter of fact, observed the letter and the spirit of the recommendations of the Treasury Committee, replies: "I am not so sure about the letter. I think it has the spirit except, perhaps, in some very small matters. I think the letter is a little ambiguous" (1642).

In view of these frank admissions by men so well qualified to judge what was in the minds of the Committee of 1898 (Lord Rayleigh was himself Chairman of that Committee), it seems to us profitless to inquire what is the correct interpretation of the language used in the Report. It is of more importance to attempt to re-define in clearer and less ambiguous terms the policy which we think it desirable should in future be followed by the National Physical Laboratory in regard to this undoubtedly difficult question.

Policy hitherto followed by Laboratory.

7. Before entering upon this task, it may be convenient to give a short account of the course actually followed in connection with the question by the Laboratory authorities up to the present time.

First of all it is to be noted that any grievance which private agencies may, so far, urge against the Laboratory is more theoretical than practical. The number of cases in which routine or commercial testing of materials has hitherto been undertaken has been exceedingly small, and the fees earned by this means are of inappreciable amount. It was, in fact, readily admitted by witnesses interested in such testing that their apprehensions of interference with their businesses were rather directed to possible future developments than based on any loss or injury already suffered (556, 712, 840).

It does not appear, however, that the limitations in protection of private enterprise, contained in paragraph 9 of the Report, are the main cause of this absence of practical grounds of complaint. If the Laboratory has hitherto done little in the way of ordinary testing of materials, this is in part due to want of adequate equipment, in part also to its situation. Dr. Glazebrook informed us that from the first it was decided to undertake commercial work (74); and this is confirmed by a printed "Statement of Work undertaken by the Laboratory," issued officially in 1902, within two months of its opening, in which it is announced that the Laboratory "will undertake all such tests on machines, instruments and materials as its equipment will permit." Neither this publication, nor any of the earlier pamphlets issued annually by the different departments of the Laboratory, giving particulars of the tests and details as to fees, contained any suggestion that the Laboratory recognised any restriction on the testing work it was willing to undertake other than that imposed by the insufficiency of its equipment (181). The first hint of such restriction in the interests of private agencies occurs in the pamphlet of 1906, and then only in connection with chemical analyses.

Restriction of activities due in great measure to lack of equipment.

8. The inadequacy of the Laboratory equipment has, until quite lately, been a very real check upon the amount of work which it might otherwise have undertaken under the head of testing of materials. This is especially true of the engineering branch. It is only within the last few months that a 100-ton testing machine has taken the place of the small 10-ton machine with which the Laboratory began its operations.

It was always intended to improve the equipment so far as funds from time to time permitted, and in 1904 the Executive Committee presented to the Treasury a carefully prepared Memorandum in support of a request for additional contributions from the Government. Among the reasons for this application the need of better equipment for the Engineering Department figures prominently. "In this Department," say the Executive Committee, "increasing facilities for testing materials are urgently needed. Requests are continually being made for work which it is quite impossible to carry out. The Laboratory possesses only a small 10-ton testing machine. Recently application was made by the Marine Department of the Board of Trade for a series of important tests involving the use of a 150-ton or 200-ton machine. These the Director was obliged to decline, and in reply the Marine Superintendent wrote stating, that while other places existed where the experiments in question could be conducted, it would be 'a decided advantage if such tests could be carried out at an impartial and independent establishment.'" The Memorandum proceeds to suggest that a 300-ton machine should be constructed for the Laboratory. "There are other institutions in which work requiring 100-ton machines can be carried out, and the machine at the Laboratory should be capable of taking special work, such as the testing of girders and struts used in constructive iron work, the testing of cables, wire ropes and hawsers or of pillars and stanchions. Besides the large testing machine," the Committee go on to say, "provision should be made in the Engineering Laboratory for the testing of stone, brick, concrete, cement and other building materials."

Extension of testing of materials contemplated.

It is evident from these and other passages in the Memorandum that a great extension of the testing of materials was in contemplation, and that a considerable increase of revenue from fees was expected to result. Indeed, Dr. Glazebrook plainly describes the Memorandum as containing "a claim on the part of the Committee of 1904 to cover the work of the Versuchsanstalt and also the work of the Reichsanstalt" (1751). He admits that this was a large claim, and thinks the Committee felt it to be so, and for that very reason accompanied their application for additional funds with an earnest request "that the Lords Commissioners of His Majesty's Treasury will carefully consider the work and organisation of the National Physical Laboratory with a view of laying down the lines that ought to be followed in the future." In making this request, the Committee may have been conscious of some inconsistency between their proposals for the development and future working of the Laboratory and the reservation in favour of private agencies, contained in paragraph 9. But, if this consideration was present to their minds, it nowhere appears in a definite form in the Memorandum. Nor does the Treasury seem at this period to have raised any question as to the interests of private establishments. According to Lord Rayleigh's evidence its influence has been consistently exerted to impress upon the authorities of the Laboratory the necessity of obtaining the funds they required, as far as possible, by means of fees. "Perhaps," adds Lord Rayleigh, "that has pushed us a little in the direction of undertaking what we might not otherwise have done" (1649).

Complaints by analytical chemists.

9. It must be remembered that up to the year 1905 no complaints had been made that the sphere of private enterprise was being invaded by the Laboratory. The alarm was first raised by the analytical chemists, and in consequence of representations made by the Society of Public Analysts and by the Society of Chemical Industry, certain changes, already referred to, were introduced into the pamphlet issued by the Laboratory in 1906. These changes seem to be on the whole regarded by those interested as sufficient, if acted up to in spirit as well as in the letter, to afford them reasonable protection (301, 309). In the 1906 pamphlet fees are no longer specified, and an explanatory statement is added, making it clear that chemical analyses only form part of the ordinary work of the Laboratory so far as they may be required for the purposes of the physical or mechanical examination of a material.

In addition, however, to these concessions, the Society of Chemical Industry further asked for the insertion in the opening sentence of the pamphlets of the words given below in italics:—

"The National Physical Laboratory has been established . . . . as a public institution for standardising and verifying instruments, for testing materials, *as distinguished from ordinary testing of materials used in commerce or in construction and machinery, which testing can be, and now is, efficiently conducted at private establishments,*

and for the determination of physical constants." The Institute of Chemistry also asked for a limitation in practically the same words.

The Laboratory authorities did not consider that this restriction had been imposed upon them. Public attention has since been called to the matter, and ultimately the questions at issue were referred for consideration to the present Committee.

Fears of interference probably exaggerated.

10. The evidence we have received shows that private testing establishments, and also professional analysts who are in the habit of adding engineering tests to chemical analyses, were beginning to look on the policy they attributed to the Laboratory as a serious menace to their interests. We are disposed to regard these fears as exaggerated. We are convinced that it has never at any time been the intention of the authorities of the Laboratory to ignore entirely the limitations of paragraph 9 and compete injuriously or unfairly with private agencies. Even were it otherwise, the unfavourable situation of Bushy House, away from the great manufacturing establishments, and from the offices of consulting engineers, would probably always preclude it from absorbing any large share of the business carried on by those agencies (1616). We think, too, that there is some force in the argument urged by Mr. Maw (1612), that the research work of the Laboratory in devising new methods of testing and elaborating old ones, would probably do more in the long run to increase the business of existing agencies than competition in the work of commercial testing is likely to diminish it. But, while holding that the apprehensions of those interested in testing work are probably excessive, we cannot regard them, in view of the diverse interpretation placed upon the Report of 1898, and of the important additions recently made to the equipment of the Laboratory, as unreasonable or wholly without foundation.

But more precise formulation of work proper to be undertaken desirable.

A more precise formulation of the testing work proper to be undertaken by the Laboratory is evidently desirable in order that public and private interests may be as far as possible harmonised.

11. In forming our conclusions on this question, there are two arguments, one urged for, and the other against, the undertaking of commercial testing work by the Laboratory, to which we are unable to attach weight.

Argument that commercial work financially necessary to Laboratory dismissed.

It is said on the one hand that unless the Laboratory is allowed to undertake ordinary commercial testing, it will be insufficiently provided with funds for the less remunerative but more important part of its work (1583, 1819). The actual fees for tests of this character have been so exiguous in the past, that the argument could at best have force only in reference to prospective income and expenditure. Even as regards the future, we believe that if the arrangements we propose are carried out, the revenue derived from fees, together with payments made for investigations undertaken on behalf of private persons, will not fall substantially short of that anticipated by the Executive Committee in their Memorandum of 1904. If, however, it be thought essentially unfair that a State-aided institution should in any way trench upon the field of private enterprise, financial considerations must clearly take a second place; and we put so high a value on the work of the National Physical Laboratory as to feel that, if it were really in danger of having its resources crippled in order that a principle of public policy should be observed, its claim upon the State to make good the loss would be irresistible.

Also that such work would interfere with research.

On the other side it has been strongly pressed upon us by several witnesses as a reason for refusing to allow the Laboratory to undertake commercial testing, that any large development of its activities in this direction would gravely impair its usefulness in that higher work of research which is its true and proper function (324, 413, 603, 742, 799, 950).

The experience of the Reichsanstalt and the Material-Prüfungs Amt in Germany may fairly be quoted against any such apprehension (1754, 1757). No doubt if the energies of the entire staff of the Laboratory were to be largely absorbed in purely commercial work, this would be an evil. But we see no probability that this result will ensue, no matter how the issue at present in controversy is decided. On the other hand we agree with the authorities of the Laboratory that a certain amount of ordinary routine testing is of real value for the purpose of keeping the staff continuously abreast of practice (161, 1757). If all so-called commercial testing of materials is to be rigidly ruled out, its exclusion would, we think, react with serious effect on the research work itself of the Laboratory, so far as industrial problems are concerned.

12. How best to consult the reasonable interests of private testing establishments without impairing the public utility of the Laboratory is a question rather of practice than of principle.

"Commercial Testing" distinguished into "Contractual" and "Investigatory" Testing.

Before proceeding further it seems to be necessary to endeavour to define what is meant by "Commercial Testing," as it appears to us that there has been some confusion of ideas in much that has been said and written on this subject. In the first place there is the ordinary testing of materials to ascertain whether their quality and behaviour are in accordance with the requirements of contracts. Testing of this nature, though much of it is now done in the testing departments of various manufacturers as part of their contract, appears to form a very considerable and probably the most lucrative part of the total work of private testing establishments. It is usually strictly routine work within defined lines to determine whether samples accord with specification, and does not call for anything but care and observation. We may, perhaps, for the sake of distinction denominate this "Contractual Testing," and it occupies a position apart from other testing or standardising work. So far as public interests are concerned it is a matter of indifference where such "Contractual Testing" is carried on, and the chief ways in which any restriction upon it would affect the National Physical Laboratory would be in its finances, and in the loss of its effect on the training of the staff of experimenters.

The other branch of "Commercial Testing" is in the nature of investigation for commercial purposes of various substances in which no question of contract arises. Though distinct from Research in the strict sense of the term, it commonly has in it an element akin to Research. For example, a Railway Company desires to experiment on the substance of their rails either as existing or to be made. A Submarine Cable Company requires information about the conductivity of copper or the various insulating materials such as gutta percha, balata or india rubber. A Harbour Authority demands an investigation into the concrete, stone or mortar with which its works have been or are to be constructed; or an Electric Lighting Company or Public Authority wishes for a thorough enquiry into electric lamps or conductors. Such enquiries demand much time and skill, and the results may not only affect important commercial undertakings but also be of great public interest.

Many of the tests made in such investigations are of the same nature as those for "Contractual Testing," but require to be repeated under varying conditions and for lengthened periods and to be tabulated and analysed. Taken singly, the tests may be of the routine character familiar in "Contractual Testing," but their scope and outcome are different and demand invention and adaptation to the end in view, if valuable results are to be obtained.

No restriction on "Investigatory" Testing desirable.

Though investigations, of which the above are but instances, have been and can be undertaken by private establishments with more or less efficiency, we are of opinion that applicants for the services of the National Physical Laboratory ought not to be refused its assistance in such enquiries, because the work could possibly be undertaken elsewhere also, if preferred. Apart from the interests of the applicants, it would be an injury to the public at large to lose the authoritative results of such investigations from a public institution highly equipped both as to personnel and machinery; and it is more than possible that if such investigations cannot be undertaken at the National Physical Laboratory they will be diminished in numbers or not entered upon at all. To place restrictions upon "Investigatory Testing," as we may perhaps call it, would be to hinder the advance of knowledge. It is not a question of the kind of tests applied to any particular substance or material, but of the nature and objects of the investigation to be undertaken which differentiates "Contractual" and "Investigatory Testing."

But Laboratory should be debarred from "Contractual" Testing, subject to the following exceptions:

We think that the Laboratory should remain absolutely free with regard to "Investigatory Testing," but that no public harm would ensue, while the case of those representing private testing establishments would be substantially met, if as a general rule it were debarred from undertaking "Contractual Testing" as above defined.

13. We therefore recommend this restriction, subject, however, to the following exceptions:

(1) Special Tests.

There are some tests, chiefly electrical, thermal, optical and other physical tests, which cannot be carried out adequately, if at all, in any existing private establishment.

In such cases it would obviously be absurd to debar the Laboratory from undertaking the work merely on the ground that the tests are intended to ascertain whether certain materials comply with the requirements of a contract.

(2) "Reference" Testing.

In the second place, no restriction should apply to "reference" testing wherever, in cases of dispute, the parties concerned agree to refer their differences to the authoritative decision of the Laboratory, or where the Laboratory is called in by a Court of Law or of Arbitration.

(3) Work for Government Departments.

Lastly, in view of the character of the Laboratory as a public institution, we think it ought to be free to accept any work which any Government Department may desire to commit to it. In this category we include the work until lately carried out at Cooper's Hill on behalf of the Indian Government.

Reference testing, for the settlement of disputes, would not, in our opinion, involve any undue interference with the work of outside agencies; while as to Government work, it is improbable that much of this would in any circumstances find its way to private testing establishments (1671, 1674).

Fees.

14. As an additional safeguard against injurious competition with private enterprise, we think wherever the same tests of materials are carried out, both by the Laboratory and by outside agencies, care should be taken that the fees charged by the former should be at least as high as those normally current. In the case of reference testing we think they should be distinctly higher. It has been represented to us that the fees at present charged by the Laboratory for ordinary commercial tests are in some instances lower than those usually charged by private establishments. We fully accept the assurances of the Laboratory authorities that it was not their intention in any case to undercut prices; but we think more attention should be paid to this matter than appears to have been done heretofore.

Testing of instruments.

15. Before leaving the subject of the relations of the Laboratory to private agencies, a word may be added on the testing and verification of instruments. The restrictions which we think should be observed by the Laboratory in connection with the testing of materials are not intended to apply to the testing and verification of instruments (and, in connection therewith, of their component parts), which is much more generally, and in our opinion quite rightly, admitted to be within its proper functions. There are, however, some cases in which it is difficult to draw a clear line between instruments and materials. One important case of this kind which has been brought to our notice is that of glow lamps (1811). Where such a doubt exists, it must be left to the Executive Committee to decide what course of action should be followed.

Publication of results.

16. The second of the specific points to which our attention has been called by your Lordships' Minute is the question of the publication of all testing work conducted at the Laboratory. On this subject our conclusions may be very shortly stated.

It was urged by some witnesses that immediate publication should be the invariable rule, and indeed the touchstone by which the propriety of the Laboratory undertaking any particular work was to be ascertained (412, 529, 933, 1113). It is obvious, however, that such a rule could not reasonably be applied to the great bulk of the standardising and verifying work. The real interest and importance of the question arises in relation to the results of investigations undertaken at the request of private individuals and fully paid for by them. The existing rule, based on the recommendation of the Committee of 1898, is to publish all such results, except in special cases approved beforehand by the Executive Committee. In practice very few, if any, exceptions have been admitted.

More elasticity desirable as to temporary withholding of results from publication in special cases.

We think that the rule, as interpreted, has proved too rigid and should be relaxed. There is cogent evidence that insistence on immediate publication of results has already deterred, and must often deter, manufacturers and others from submitting to the Laboratory investigations likely to yield new results of great importance that would hardly be attainable through any other agencies (1318, 1568, 1623). In one case it has been suggested that the operation of the rule has been to hand over to Germany an important branch of industry which might otherwise have been secured for this country (1761).

We are of opinion that the Executive Committee should hold themselves somewhat freer than heretofore to exercise a discretion as to the withholding of results from publication, either wholly or in part, for a limited number of years. But we also think that in cases where publication is thus deferred a considerably higher fee should be charged to the persons for whose immediate benefit the investigation is to be carried out. Higher fees should be charged in such cases.

It is possible that by raising the fees for reference testing and by increasing the number of research investigations carried out on behalf of private persons, and the charges made for them, the Laboratory may be enabled to recoup any loss of prospective income caused by the restriction on Contractual Testing.

17. It has been suggested that the authorities of the Laboratory might with advantage be kept more closely in touch with the practical needs of industry by the institution of small Advisory Committees representative of different technical interests (346, 376). The Executive Committee has already power to appoint Sub-Committees of this kind, including members not already on the General Board or Executive Committee; and we understand that such Committees were, in fact, appointed at the institution of the Laboratory and that their members are frequently consulted by the Director, although no regular meetings are held (1785–1796). We recommend that these Committees be kept up-to-date and in close touch with the Executive Committee. Advisory Committees of technical interests

18. Subject to these observations we do not consider that any alteration is required in the scope of the work of the National Physical Laboratory, as defined by the Committee of 1898. The conclusions of that Committee were, with minor exceptions, generally accepted by the witnesses who appeared before us; and we have not thought it necessary to do more than recommend certain slight modifications and a more precise determination of some doubtful points of detail. Conclusion.

19. In conclusion we desire to record our grateful sense of the assistance rendered by our Secretary, Mr. G. C. Upcott, in the course of our inquiry, and of the ability and courtesy with which he has discharged his duties.

We have the honour to be,

Your Lordships' obedient Servants,

(*Signed*) G. W. BALFOUR.
*A. NOBLE.
*J. WOLFE BARRY.
W. J. CROSSLEY.
ROBERT CHALMERS.

G. C. UPCOTT,
Secretary,
16*th December*, 1907.

Note by Sir A. Noble and Sir J. Wolfe Barry as regards paragraphs 12 *and* 13.

We are of opinion that the restriction which we have recommended (p. 9) in respect of "Contractual Testing" should come to an end after a definite time. A restrictive period of 10 years would we think adequately meet the case presented to us on behalf of private testing establishments, and would safeguard the interests of the public, which will be best served by leaving the authorities entrusted with the administration of the National Physical Laboratory completely free (as is the case in the National Laboratories of Germany) to exercise their discretion in accepting or refusing any description of testing work.

(*Signed*) A. NOBLE.
J. WOLFE BARRY.

16*th December*, 1907.

* Subject to the note appended.

TREASURY MINUTE DATED THE 1ST FEBRUARY, 1908.

My Lords have before Them the Report of the Committee appointed by Their Minute of the 31st December, 1906, to inquire generally into the work now performed at the National Physical Laboratory, with special reference to the character of the mechanical, physical and chemical tests undertaken there, the possibility of their interfering unduly with the business of other agencies, and the desirability of publishing the results of all such testing work.

My Lords approve of the recommendations contained in the Report of the majority of the Committee. They learn that the President and Council of the Royal Society accept in principle the recommendations contained in the Report of the Committee, and that the Executive Committee of the National Physical Laboratory have expressed their readiness to use their best endeavours to carry the recommendations into effect.

NATIONAL PHYSICAL LABORATORY.

MINUTES OF EVIDENCE

TAKEN BEFORE THE COMMITTEE APPOINTED BY THE TREASURY TO ENQUIRE GENERALLY INTO THE WORK PERFORMED BY THE

NATIONAL PHYSICAL LABORATORY,

WITH

APPENDICES AND INDEX.

Presented to both Houses of Parliament by Command of His Majesty.

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MINUTES OF EVIDENCE

TAKEN BEFORE

THE DEPARTMENTAL COMMITTEE

Appointed to enquire generally into the work performed by the National Physical Laboratory.

FIRST DAY.

Monday, 18th March, 1907.

PRESENT:

THE RIGHT HON. GERALD W. BALFOUR (*Chairman*).

SIR ANDREW NOBLE, BART., K.C.B.
SIR JOHN WOLFE-BARRY, K.C.B.
MR. ROBERT CHALMERS, C.B.
MR. G. C. UPCOTT (*Secretary*).

Dr. RICHARD TETLEY GLAZEBROOK, F.R.S., called and examined.

Dr. R. T. Glazebrook. [6] 18 *Mar.*, 1907

1. (*Chairman.*) Dr. Glazebrook, you are no doubt aware that this Committee was appointed in consequence of complaints that were made regarding some of the testing work of the Laboratory to the effect that it was inconsistent with the recommendations of the Treasury Committee of 1898, and encroached upon the sphere of private enterprise. Our reference extends to the general work of the Laboratory, and to possible future developments of it, but we think that it would be desirable that this particular issue should be cleared up in the first instance. Accordingly the questions that I propose to address to you to-day will mainly or exclusively refer to the following points. First, the actual nature of the work performed under the head of the testing of materials; secondly, the character and grounds of the objections that have been taken to it; thirdly, the interpretation placed by the authorities of the Laboratory on the Report of the Treasury Committee of 1898, and, fourthly, any general considerations you may desire to urge in favour of maintaining the existing practice. Now to take the first of these points, namely, the actual nature of the work performed under the heading of the testing of materials, I should like to direct your attention in the first place to a Pamphlet on the Statistics relative to the growth and work of the National Physical Laboratory from 1901 to 1906. On page 17 the work of the Laboratory appears to be divided under three heads, organisation and installation of apparatus, research and maintenance of standards, and the commercial testing of instruments and materials.* That is so, is it not?—Yes.

2. I suppose you would agree that there is a very important distinction to be drawn between the testing of instruments and the testing of materials?—I think there is a distinction to be drawn, but I think the testing of materials is necessary for the proper testing of the instruments.

3. The testing of materials was, I think, a separate head in the recommendations of the Treasury Committee on the report of which the Laboratory was founded?—Yes.

4. In that Table, on page 17, while distinguishing between the testing of instruments and the testing of materials, you do not give the time devoted by the members of the scientific staff of the Laboratory separately according as it was devoted to the testing of instruments or to the testing of materials respectively?—That is true. The distinction is not drawn in this list.

5. Would you turn to page 19 of the same Pamphlet. Under the heading "Fees for tests" there are four separate sub-heads, Verification, Rating, Engineering, and Physics?—Yes.

6. Does Verification cover more than the work performed at Kew?—No, it does not.

7. You mean any verification work that may be carried out in the department of Engineering or the department of Physics is given separately?—Certainly. Verification and Rating both entirely relate to Kew, and it perhaps would have explained matters better if I had bracketed those together under "Observatory Department."

8. Yes, Rating refers to watches?—Rating refers to watches and clocks and chronometers. The terms Rating and Verification happened to be the old terms that were used in the Kew Reports for many years, and they have remained as sub-heads.

9. I will ask you to turn back to page 14, and if you do not mind going through the analysis of the test work given on that and the subsequent pages *seriatim*, I will ask you to tell me which of the items in your opinion come under the head of testing of material and which come under other heads. Perhaps it will be sufficient if you tell us which of these items come under testing of materials, so

* See Appendix I, V, page 94.

r. R. T. azebrook. *Mar.,1907*

that we may know exactly where we stand?—There may be a little testing of material in the resistance coils, but it is trifling and practically negligible. It sometimes happens that a specimen of wire is sent down before being actually made into an instrument and we are asked to test that.

10. Still, that item would properly come under the verification of instruments?—I think so.

11. (*Sir Andrew Noble.*) You could not say if you were testing a part of an instrument to prove its efficiency that that could be called testing material. If they sent wire before it was put into the coil, then you would call it testing material, but not when you have got to satisfy yourself as to a cause of error?—I think that is the case. In the electricity and magnetism tests, a few of the conductivity tests might be described as testing of material.

12. (*Mr. Chalmers.*) But always physical tests?—These are all electrical tests. Under electricity and magnetism they are all physical and electrical tests.

13. (*Chairman.*) What of permeability and hysteresis?—That is a test on material which is going to be made into dynamos or electrical machinery of various kinds. That again is physical and electrical testing.

14. But I do not think the complaints have been entirely confined, so far as I gather from the Papers which have been submitted to us by the Treasury, to chemical tests?—I was making a distinction between physical and mechanical tests. In the inductance test there is no testing of material.

15. Ammeters, volt-meters, ohm-meters and supply meters?—Practically there is no testing of material there until you come to the last line but one—insulation and dielectric strength. That is electrical testing of material, not mechanical usually.

16. What is included under the miscellaneous—anything of importance?—I think nothing of importance.

17. Under the heading of thermometry, you have the melting point of alloys and the freezing point of liquids?—The melting point of alloys and the freezing point of liquids might be called testing of materials. I do not think there is anything else.

18. What do you say of the items under the heading of metrology?—Co-efficients of expansion sometimes involves testing of material that is going to be made into scales or into measuring instruments of various kinds, and density determinations (but there have been none lately) is testing of material.

19. Testing of glass vessels and weights is obviously not testing of material. Then metallography?—That is testing of materials.

20. And both the items of photo-micrographs of specimens of metals and cooling and heating curves?—Both.

(*Sir Andrew Noble.*) I do not like to differ from you, but I should not have admitted that taking a photo-micrograph of specimens of metals you could fairly call testing of materials. Of course, it is simply because you are taking rather a different view of testing material from what I do. What should you say, Sir John?

(*Sir John Wolfe-Barry.*) Photo-micrographs; that is an examination I suppose rather of a specimen.

(*Sir Andrew Noble.*) It is a physical examination, I should have said.

(*Sir John Wolfe-Barry.*) Of the nature of the material?

(*Sir Andrew Noble.*) Of the nature of the material. Everyone of course speaks for himself, but what we look upon chiefly as testings of material, taking steel for instance, are the elasticity, and the breaking point, and the elongation under the test, and so on.

(*Witness.*) That was the point that I referred to a little time ago when I said these were physical and electrical and optical tests, as distinct from the purely mechanical.

21. (*Chairman.*) Mechanical or chemical?—Yes, it is neither mechanical nor chemical. I think the difficulties have arisen with regard to the mechanical and chemical tests.

22. I will come to that later. First of all, I should like to ascertain the exact facts.—Yes.

23. (*Sir John Wolfe-Barry.*) You passed glass vessels just now, and the Chairman said that of course that is not testing of materials, but is not it testing of material?—No, glass vessels are rarely sent to us for testing of material.

24. What are they sent for?—Determination of volume.

25. Oh, I thought it might be for bursting strain?—No.

26. (*Chairman.*) Chemical tests; complete analyses; that clearly has reference to testing of material. Microscopical tests?—That is chiefly testing of material in the wide sense that has been used.

27. Under the head of optics are there any items which would be treated as partaking of the character of tests of materials?—Yes, optical constants of glass and other materials, and the tests of arc lamp carbons, are tests of the material.

28. What about incandescence lamps and gas mantles?—Incandescence lamps are ordinary electric glow lamps.

29. You regard them as instruments rather than as material?—Yes, I think so.

30. And the same with gas mantles?—Yes.

31. In the Engineering Department what would you treat as testing of materials?—The strength of materials, steam pipe lagging, calorific value of fuel, and alternating stress tests, and microscopical examinations of metals.

32. The Observatory Department, I think, is wholly concerned with instruments?—Yes.

33. So that, summing up, it would be correct to say that in the Physics Department, some conductivity tests, the permeability and hysteresis tests, and dielectric strength tests, are tests of material. Under the heading of thermometry, the melting point of alloys and the freezing point of liquids would be reckoned in the same class?—Yes.

34. Under metrology, the co-efficients of expansion, in some cases at all events, and density determinations?—Yes.

35. Under metallography, photo-micrographs of specimens of metals, and cooling and heating curves?—Yes.

36. And all complete analyses under the head of chemical tests; the slides of water deposit, and samples of paper under microscopical tests; and under the head of optics optical constants and arc lamp carbons?—Yes.

37. In the Engineering Department, the strength of materials, steam pipe lagging, calorific value of fuel, alternating strength tests and microscopical examination would also come in the same class?—Yes.

38. Do you think that it would be possible for you to make a separate calculation of the testing work done on materials and inform the Committee what are the fees which have been paid in respect of it and how much time has been devoted to it by the staff?—Over how long a period?

39. I should think we might take the same period as that to which the Pamphlet on statistics refers?—That is the whole history of the Laboratory.

40. Back to the years 1904, 1905 and 1906?—I will do what I can. I cannot say that it will be absolutely accurate.

41. If it is approximately accurate it will really be sufficient for our purpose, I think. You see I want the Table on page 17 made out separately, the testing of instruments and the testing of materials?—Yes. That Table on page 17 only refers to one year, I think.

42. If you could do it for each of the three years it would be, perhaps, convenient?—Yes.

43. Over and above the tests mentioned in that list which we have just been going through; are there any other cases of testing of material which you anticipate will come within the purview of the work of the Laboratory in the immediate future?—We have been asked from time to time to take up other tests on material, but I do not think there are any that the Committee have supposed that it would be right or wise to take up beyond the kind of thing that is indicated here. Strength of materials, for example, covers a wide range, and I should hope to extend the apparatus for testing strength of materials in various new forms and various manners.

44. Quite so. The Pamphlet issued in 1902 with regard to the work of the National Physical Laboratory announces that the Laboratory will undertake all such tests on machines, instruments and materials as its equipment will permit, and since that date the equipment has been considerably extended, and I suppose will be still further extended in the very near future?—It is being extended at the present moment and will be extended in the near future. There has not been very much change relating

to what may be called the mechanical and engineering tests of materials since 1902, until just now.

45. You are about to put up a large testing machine of the capacity of 100 tons ?—Yes.

46. And that, I presume, will considerably increase the number of tests of materials ?—It might do so.

47. Passing from that to the objections which have been raised to the commercial testing of materials, let me just ask you whether the objections made have or have not been confined entirely to the testing of materials ?—As far as I recollect the detailed objections have been confined entirely to the testing of materials. The objections that have been raised in public, or in documents before the Committee of the Laboratory, or in correspondence, are raised generally, I know, to the Laboratory doing any work for fees.

48. Any work of any kind for fees ?—Yes, apart from standardization, and I think the Committee will find that is very much at the bottom of the whole difficulty. Objections are now being raised to chemical work and to the testing of materials as being perhaps the most vulnerable points. But at the bottom at any rate of the objections raised by a number of the objectors is the definite statement that a State-endowed laboratory ought not to undertake any work for fees. It is looked upon as a case of municipal trading or State trading, which ought to be stopped.

49. Have all the objections been based upon that general ground ?—I do not think that general ground has been put forward very completely or very fully in letters that have been addressed to the Committee; for example, the letters from the Institute of Chemistry or the letters from the Society of Public Analysts have not, I think, taken that general ground.

50. You say in your *précis* that the objections urged have been general in character, that the Committee have asked for detailed instances, but to no purpose ?—By that I meant that all the letters have referred to the statements that occur in the Report of the Committee of 1898 as to the limitations of the work. The objectors have said in a general kind of way that the Laboratory is not complying with those limitations, but they have given no instances of cases in which the limitations have not been complied with which would bear investigation.

51. Who are the parties who have made these complaints and raised these objections ? Have they been aggrieved individuals, or societies acting on behalf of aggrieved individuals ?—My belief is that they are societies acting on behalf of individuals who thought they might be aggrieved, or who have taken some kind of theoretical objection. I have found no cases of aggrieved individuals.

52. No case has been put forward to the Laboratory of some particular individual who felt himself aggrieved by competition in the work which he had been in the habit of carrying out ?—No case that will bear investigation.

53. (*Sir John Wolfe-Barry.*) You say you have had no case that will bear investigation, but you have the complaint coming from a rival testing proprietor, have not you ?—I do not think that has come formally before us.

54. I mean we have had Mr. Blount's letter brought before us ?—Yes.

55. (*Sir Andrew Noble.*) As far as I have understood, the chief complaints have come from the Institute of Chemistry? —Yes.

56. But I have never heard that any of the engineering firms have made complaints. Do you know of any ?—I know of none from engineering firms.

(*Sir John Wolfe-Barry.*) No engineering firms. We had a letter sent to us from Mr. Blount, who is a professional chemist, I believe.

(*Sir Andrew Noble.*) As far as I know, every large engineering firm has its own testing arrangements.

57. (*Chairman.*) I will read this passage from Mr. Blount's letter which I have here: "The great body of engineering opinion is in the same sense. There is among engineers a feeling that the National Physical Laboratory in undertaking commercial testing of materials is acting unfairly, and although the Institute of Chemistry does not regard this as the chief evil, yet it agrees that this is a real grievance. Both professions are desirous of the welfare of the National Physical Laboratory in its proper work of standardisation and physical research, but they are opposed to its undertaking commercial testing, whether chemical, physical, or mechanical." That complaint is of a perfectly general character ?—Yes

58. May that be taken as typical of the complaints in general which you have received ?—I think it may.

59. (*Sir Andrew Noble.*) But you have not received any complaints from engineers at all—I mean as regards the testing of engineering materials ?—I have not received any complaints.

60. Any complaints from engineering firms ?—Do you mean in an official capacity or privately ?

61. Either privately or in an official capacity ?—I have received privately one complaint from an engineer.

62. (*Chairman.*) Was that of a definite character, or only of a general character ?—That referred to the undertaking of the work for the Indian Government.

63. It did not refer to the general work of the Laboratory at all ?—I think it was felt that if that work were undertaken by the Laboratory it would offer opportunities for work of a general character being undertaken, and so far it was of a general character, but it related specifically to that work.

64. You say in your *précis* work has been declined in order to avoid competition and for other reasons, and you refer to page 23 of the Pamphlet on Statistics. Would you kindly turn to that ? Could you point out to us among the tests declined those which have been declined on the ground of competition ?—In 1905——

65. Were there none before 1905 ?—I think not. In 1905 there are several chemical tests mentioned, tests on copper wire declined as purely chemical tests; analyses of brass and aluminium, and analysis of brass; analyses of rubbers for adulteration. Chemical analysis of petroleum and petroleum products. Tests on copper wire for conductivity and chemical composition. Tests on storage cells at the makers' works.

66. Tests on storage cells: would that be a test of material ?—No, perhaps not.

67. Was that, as a matter of fact, declined on the ground of competition ?—It was felt that consulting engineers were in the habit of going out to make tests of that kind at works, and, although it was very much of the nature of standardisation, it was thought perhaps not desirable for us to do work which we believed various consulting engineering firms could do.

68. But you would regard that as approximating to the nature of standardisation, would you not ?—Yes. Then to continue the list of chemical tests declined—Chemical analysis, arsenic in copper bar, chemical analysis (Borough of Smethwick), thermal tests on calculating machines, chemical analysis of limestone, tests on stoneware and cement pipes, insulating tubes, efficiency of steam turbine, tests on rotary steam engine, effect of water on gutta-percha, and certain steel analyses.

68A. All those instances in which work has been declined belong to the years 1905 and 1906 ?—That is so, I think. There is one in 1904 of a similar character, analysis of oil derived from seed; and there is another one, tests relative to tinning on copper vessels, in 1905.

69. I notice in the Table giving the analysis of test work there were, in 1904, 22 chemical tests; in 1905, 48 chemical tests; and in 1906, only 6 chemical tests ?—Yes.

70. That was in consequence, I presume, of the objections which had been raised ?—I do not think so. I have full particulars of the chemical tests here.

71. I mean the drop in the numbers ?—I do not think it was in consequence of that.

72. Has it not been suggested that in addition to the objection arising out of an encroachment on the province of private enterprise the undertaking of commercial work by the Laboratory would divert the energies of the Laboratory from what is called its proper work, standardisation and physical research ?—It has been suggested, but it is entirely a mistake, a serious mistake.

73. You feel quite sure that the energies of the Laboratory have in no way been diverted by reason of your undertaking tests of that sort ?—I am absolutely certain on that point, and I am absolutely certain that without such tests, or a very large number of them, the research work would not be of the important character which it is.

74. Now I come to the interpretation placed by the authorities of the Laboratory on the report of the Treasury Committee of 1898. You state in a Pamphlet issued in 1902, in a passage to which I have already referred, that the Laboratory will undertake all such tests on machines, instruments and materials, as its equipment will permit,

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and I think in your *précis* of evidence you say that from the first commercial work was contemplated ?—Certainly.

75. That last statement is clearly justified by the contents of the Pamphlet issued in 1902, which is, I think, the first Pamphlet you published ?—Yes, and that was issued within two months of the opening of the Laboratory.

76. Who was responsible for this decision to undertake commercial work ?—The Executive Committee.

77. How was the first Executive Committee composed ? —I think you have a list before you. It was composed of the members of the Committee of 1898, which drew up the Report, with one exception, Mr. Chalmers, and the addition of the members of the Kew Committee of the Royal Society, and of one or two other names.

78. So that those who were responsible for drawing up the Report were also responsible for this decision to undertake commercial work ?—Certainly.

79. Could you point to the passages in the Report of the Committee which you think justified the undertaking of ordinary commercial testing of materials ?—The main recommendation is that a public institution should be founded for standardising and verifying instruments for testing materials, and for the determination of physical constants. That is the main recommendation of the Report.

80. You base yourself on the inclusion of the testing of materials in that recommendation ?—Partly so.

81. But is it not necessary to interpret that phrase by what is contained in the body of the Report ?—Certainly.

82. Will you point to those passages in the body of the Report which you think justify that broad interpretation which the Executive Committee seems to have taken ?—Yes. It is also provided that fees are to be charged for work done, Clause 24.

83. That would apply to the standardising and verifying of instruments, would it not ?—Yes.

84. Can you draw any conclusion from that with regard to the undertaking of commercial testing of materials ?—You are limiting your questions at present solely to the commercial testing of materials ?

85. Yes.—It is said in the early part of the Report, on the first page, that " the Committee have also visited the Physikalisch-technische Reichsanstalt and the Konigliche Mechanisch-technische Versuchsanstalt at Charlottenburg, and the Konigliche Mechanische Institut at Potsdam, to obtain information as to foreign institutions in which work of the kind indicated in the reference is performed."

86. What inference do you draw from that ?—May I supplement this further by the aid of one or two other statements of the kind.

87. Yes.—A little later on in the Report there is another reference to the work of the Reichsanstalt in Clause 7 and finally in Clause 18 " In the opinion of the Committee the proposed institution should be established at the national expense on lines similar to, though not at present on the scale of, the Physikalisch-technische Reichsanstalt referred to above. The possibility of future extension should however be kept in view from the first."

88. With regard to those passages which you have referred us to, the passage in the first section and the passage in Section 18, the passage in the first section mentions the Physikalisch-technische Reichsanstalt and the Mechanisch-technische Versuchsanstalt as foreign institutions in which work of the kind indicated in the reference is performed ?—Yes.

89. Do you think it is legitimate to draw an inference from that as to the carrying out of tests on material. Let me refer you to the terms of the reference, if you will kindly turn back to the previous page. Would you read the terms ?—" To consider and report upon the desirability of establishing a National Physical Laboratory for the testing and verification of instruments for physical investigation ; for the construction and preservation of standards of measurement ; and for the systematic determination of physical constants and numerical data useful for scientific and industrial purposes—and to report whether the work of such an institution, if established, could be associated with any testing or standardising work already performed wholly or partly at the public cost."

90. There seems to be no mention of the testing of materials in that reference at all, and even the testing or standardising work, which is referred to in the last line, is testing or standardising work already performed wholly or partly at the public cost. Do you think in face of the terms of that reference that you can quote the passages in the first section as justifying the carrying out of commercial testing of materials ?—My instructions when first I was appointed were to visit Berlin and Paris and to examine the work at the Reichsanstalt, the Versuchsanstalt, and the Laboratoire d'Essais, and report upon it.

91. That was by the Executive Committee ?—Yes.

92. You were under the orders of the Executive Committee, and naturally carried out their instructions. But my questions now are directed to the interpretation of the Report of the Committee of 1898. I want to know what are those passages which are held to justify the undertaking by the Laboratory of the work of commercial testing of materials. It is quite clear that the Executive Committee interpreted the Report so as to cover that. That is evident from the passage which has been referred to in the Pamphlet of 1902. But the question is whether there is anything in the Report which justifies that. Let me now ask you to turn again to the other passage which you have referred to as justifying it, the passage in Section 18 " In the opinion of the Committee the proposed institution should be established at the national expense on lines similar to, though not at present on the scale of, the Physikalisch-technische Reichsanstalt referred to above." Does the Physikalisch-technische Reichsanstalt as a matter of fact undertake the commercial testing of material ?—Yes : not the mechanical testing of materials, but all the other commercial testing of materials that you have referred to.

93. Is not the testing of materials carried out at the Versuchsanstalt and not the Reichsanstalt ?—Not the physical testing, such as the electrical and optical tests. All the work you referred to in the original series of questions dealing with the analysis of test work on pages 14 and 15 of my statistics, down to the first clause on page 16, is done at the Reichsanstalt : electricity and magnetism, resistance coils—all that work ; all the thermometry, metrology, the testing of glass vessels, a certain amount of metallography, I think, a good deal of the chemistry, and all the scientific tests and all the optical work is done at the Reichsanstalt. The Versuchsanstalt deals with mechanical and chemical tests.

94. So that a considerable amount of the testing of material is done at the Reichsanstalt as well as at the Versuchsanstalt ?—Certainly.

95. And so far as work of that character is done at the Reichsanstalt you consider yourself entitled to point to this passage in the Report as justifying it ?—Certainly.

96. Would you turn to Section 9, which seems to be the section dealing more particularly with this question ? The two first sentences in that paragraph are to this effect : " There is much evidence that further facilities are needed by the public for the standardising and verifying of instruments, both for scientific and commercial use ; and also that it would be of great benefit to trade if means were provided for the public testing of the quality of certain classes of materials. In particular, the Committee desire to draw attention to the evidence which has been laid before them as to the difficulties arising in certain Government departments in their dealings with contractors and others which might be overcome by the establishment of an independent testing authority." So far as I have been able to discover, these, and some further sentences lower down in the same section, are the only ones in the Report which bear in a positive sense upon the question of what it was the Committee meant by the testing of materials. Other sentences are qualifying. They rather refer to what should not be done in the way of testing materials ?—I think there are sentences of that kind in Clause 8 and in Clause 7.

97. Would you point to them, please ?—In Clause 7, " the electrical units being based upon theoretical definitions are on a somewhat different footing from units of weights and measures. Investigations are continually being made as to the degree of accuracy with which the legal standards represent the absolute values. Furthermore, there is some uncertainty as to the permanence of the standard instruments. Investigations on both these points are being carried out systematically at the Reichsanstalt, but there is no provision for such work at the Board of Trade Electrical Laboratory or at any other public institution in this country." That all relates to the testing of materials that are employed for electrical standards.

98. But only in connection with the electrical standards themselves. That is, not to the testing of materials pure and simple ?—That is so, but the materials used in the electrical standards are very various and very numerous.

99. But such tests are only incidental to the standardisation of instruments ?—Still, they are tests.

100. But I am trying to get hold of those passages in the Report which really refer to the testing of materials as such ?—I think it is probable that they are mostly if not entirely in Clause 9.

101. What do you consider to be the meaning of the two sentences which I have just read. Do they not suggest that the Committee consider that a useful work might be done by the National Physical Laboratory as an independent testing authority when other authorities are at variance, and in that case only ?—It never occurred to me that it only applied to the case in which other authorities were at variance.

102. Or at all events where two parties between whom a contract existed wished to have it authoritatively decided what the quality of a particular material was. Stress is laid on the authoritative character of the determination. If that is not the meaning of it, how do you explain the sentence that immediately follows ? "It would neither be necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories" ?—It goes on after that, "but there are many special and important tests and investigations into the strength and behaviour of materials which might be conducted with great advantage at a laboratory such as is contemplated in the reference."

103. But those are special and important tests. There again you have a distinction ?—Yes.

104. How can you on those words justify the carrying out of ordinary commercial testing ? If you go on you see the following sentence: "As illustrations we may mention investigations into the behaviour of metals and other substances under continuous or alternating stresses which investigations are not, so far as we know, conducted at the present time at any testing institution in this country, and which could only be undertaken with satisfactory and authoritative results at a public laboratory" ? —Yes.

105. My questions are simply intended to elicit from you whether you think that the Report really does cover the work that you have done. I am not now directing your attention to the question whether it is desirable in itself that such work should or should not be carried out at the Laboratory ?—Yes, that I quite understand. I have always understood that the Committee were complying with the restrictions of the Report in the way in which they carried out the work of testing materials at the Laboratory. Chemical work has from the beginning been declined, except in quite exceptional circumstances.

106. But you are only able to point to cases in which chemical work has been declined in the last three years ?—It did not come before. There were no cases of chemical work before which we undertook which could not be thoroughly justified under the clauses.

107. On what grounds do you think yourself entitled to draw a distinction between chemical work on the one side and physical and mechanical work on the other ?—We were established as a Physical and Mechanical Laboratory to undertake the testing of materials.

108. Yes, but not apparently the testing of materials of various kinds which is now carried out in private or other laboratories, and yet it does appear that from the very first the Executive Committee determined to carry out such work ?—Certainly.

109. Do you think that is consistent with the Report ?—I take it there are inconsistencies probably in the Report itself; take, for example, the statement that the Versuchsanstalt might be taken as an institution of the kind where the work was carried out and some other institutions here and compare it with Section 9. The Committee had to interpret the sections of the Report by the aid of the knowledge which they possessed as being the successors of the original Committee, and carry out the recommendations of this Report in accordance with that knowledge, and, as far as possible, with the general interpretation of the preamble and specific sentences in the body of the Report itself.

110. Then am I really to understand that you think that the statement in the pamphlet of 1902 that the Laboratory was "prepared to undertake all such tests on machines, instruments, and materials as its equipment will permit" is consistent with the sentence in the Report that "it would neither be necessary nor desirable to compete with nor interfere with the testing of materials of various kinds as now carried out in private or other laboratories" ?—They were quite consistent at that time, because the equipment of course was very small, and I think the Laboratory has been worked by the Committee so as to be quite consistent with the tenor of the Report up to the present.

111. With that sentence that I have just read out ?—Yes.

112. But the Executive Committee itself, I gather, seems to have felt that there was a certain ambiguity, shall we say, in the Report, for I think you say in your *précis* of evidence the Executive Committee have been aware of the provisions of the Report, and have tried to observe them as far as possible, consistent with other statements in the Report ?—Yes.

113. So that apparently the Executive Committee must have themselves felt there was some inconsistency in the Report ?—I think it has been acknowledged from the commencement.

114. That I take to be your own view, and against such a statement as I have just read that "it would neither be necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories," you rely as a justification for what the Laboratory has actually done on references to the Versuchsanstalt and the Reichsanstalt ?—References to the Versuchsanstalt and the Reichsanstalt, and to the detailed statements of investigations that are referred to and are authorised.

115. Which detailed statements ?—The one I referred to under Section 7 as tests on electric standards and materials used for electrical standards. The one that I did not refer to in detail, but did just mention, under Section 8, is as to tests required on standards for the Board of Trade.

116. But standards of a Government Department surely have no bearing upon the question of the carrying out of ordinary commercial testing. The question of work done by a Government Department stands surely on a different footing ?—I should think it did. I may refer again to Section 11, which relates to the testing of certain instruments carried out at the Kew Observatory under the direction of the Kew Observatory Committee. The weak point of those tests had been that they were not tests on materials with which the instruments were made, and there are numbers of instances in which tests on those materials could have been utilised to make the tests on the instruments much more useful and much more valuable.

117. Still all those tests would be merely incidental to the tests of instruments. They are not tests of materials as such ?—I do not quite understand what is meant by the test of materials as such. If a man sends us a piece of steel to test, he is going to make a girder of it, or a joist, or a boiler or something, and in that way the testing of materials is incidental to the testing of the completed thing, whatever it may be. So I take it the tests on the copper wire which is used in an electrical machine, or on the glass which is used in a telescope, are tests of material. You may say perhaps, they are incidental to the instrument we are finally going to test, but is not the position exactly the same with regard to steel ?

118. I should have thought myself you could draw a very broad, clear distinction between tests of materials which are undertaken with a view of testing a particular instrument, and tests of material which are of a general character ?—The other would merely refer to the materials themselves. I do not think the tests I have been speaking of are merely tests of materials on an instrument which is coming into the Laboratory.

119. At Kew do they send you a particular kind of glass and ask you to make a test of that ?—Certainly.

120. Then it is not true to say that all the testing at Kew is testing of instruments ?—At the present moment since the Laboratory has been established glass for optical purposes and such materials are sent to us for test fairly often. Those tests are all made at Teddington.

121. The tests at Kew are all clearly tests of instruments ? —They are all clearly tests of instruments, but the tests at Kew have been made immensely more valuable since the foundation of the Institute by the fact that that testing of materials for instruments is made at Teddington.

122. But you do not agree with the distinction I should draw between the testing of materials incidental to the testing of instruments, and the testing of materials as such ? —I think the materials as such are all going to be used either in some instrument or some structure.

123. Has any communication passed between the National Physical Laboratory and the Treasury on this subject ?—Yes.

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124. Have the Treasury represented to you that in their view you were exceeding the limits laid down in the Report?—I do not think the Treasury have represented that.

125. They have merely transmitted to you representations made by others?—Yes.

126. I think the Laboratory has received a considerable accession of income since it was first established?—Certainly.

127. Was that in consequence of the appeal made to the Treasury in 1904?—I think that was the date.

128. In the Memorandum that was drawn up by the Executive Committee?—Yes. It is dated February, 1904.

129. In that Memorandum is it not made perfectly clear that a great extension of the testing of materials was in contemplation?—I think so.

130. So that if the National Physical Laboratory has offended the Treasury may be said to be a partner in the offence?—I hope the Treasury have been aware from the beginning of exactly what the Laboratory were doing.

131. Anyway, in connection with that Memorandum and the increase of income that was asked for in it, the Treasury made no representations whatever on the question of whether you were or were not exceeding the recommendations in the Report?—I do not think the matter was raised until comparatively lately, 1905.

132. I should like next to know from you the general grounds on which you think that the practice of the National Physical Laboratory can be defended independently of any justification that may be offered by the terms of the Report of 1898. You have in the answers that you have given to the questions I have been addressing to you stated your grounds for thinking that the National Physical Laboratory was justified by the terms of the Report of the Treasury Committee of 1898?—Yes.

133. Irrespective of that, I want to know your views upon the merits and on what general grounds you would defend the practice of the Laboratory?—In the first instance there is a very considerable amount of evidence (and I should like to refer you to some of that in detail in a few moments) as to the influence that the Reichsanstalt and Versuchsanstalt have had on German trade and manufacture. Almost as soon as I was appointed I was instructed by the Committee to visit those institutions in Germany and to see exactly what was done there. I did that, and I have laid before the Committee some particulars as to the work of the Reichsanstalt and of the Versuchsanstalt in one of these Pamphlets that have been circulated to the Committee. I think the work of the Reichsanstalt is fairly generally known; but it appears from a statement taken from the Report of the work of the Reichsanstalt, Division 2, for the year 1905, that commercial tests of exactly the same kind as those that are made in the National Physical Laboratory (Physics Department) are carried out in the Reichsanstalt. Verification of scales, measurement of bolts, rings, &c., standard Hefner lamps, standard glow lamps, gas incandescent lamps, oil tests, thermometers of various kinds, and apparatus for testing mineral oils, petroleum testers, viscosity apparatus, boiling-point apparatus for mineral oils, calorimeter, calorific value of coal, flash point of petroleum; and then all the electrical instruments come just in the same way as they do in the Pamphlet for the Laboratory. The Versuchsanstalt has since the date of the establishment of the Laboratory become the Material Prüfungs Amt. It has changed its name, and we are told in the Scheme of Organisation and Management of the Material Prüfungs Amt that the institution will undertake the duties of: "(*a*) Improving and perfecting the methods, machines, instruments, and apparatus for the testing of materials. (*b*) Testing materials and portions of structures and issuing official statements and certificates as to the results, either (1) in the interests of the public or of science, provided the means for the investigation be placed at its disposal either by the State or by private persons proposing the investigation; or (2) for persons, whether official or private, desiring the information, and prepared to pay fees in accordance with the Ordnance as to fees." And then the Pamphlet which I am reading from goes on to explain the conditions under which those tests are to take place. Page 4 of that Pamphlet states: "Accordingly, the institution gives to a person proposing an enquiry, either of its own initiative or at his request, full advice as to the kind and extent of the proposal, the kind of test and the nature of the investigation; and while everyone has the right to propose to the institution, as a public testing institution, and on the ground of the ordinance as to fees, such tests as he thinks right, at the same time the institution will carry through complete tests bearing on the proposal in any case in which it does not think the test proposed sufficient to demonstrate fully the properties of the material tested," and it continues to explain how the certificates of the institution are to be used: "Since the support and furtherance of industrial efficiency must be the aim of a public institution no objection can be raised to the proper use of its certificates for the advertisement of goods. The institution has the help of the law to prevent their improper use in trade rivalry, and on this account its certificates are made as definite as possible"; and then, finally, "To aid persons in using the institution a complete table of charges will be prepared. Separate sections of this will relate to the different kinds of tests as these develop themselves in the course of time. The statement of fees affords also a *resumé* of the help the institution can offer, so that information can be obtained as to what extent and in what manner its assistance can be expected in special cases."

134. Those passages clearly prove that the work carried on by the National Physical Laboratory is now carried on by the Reichsanstalt and the Versuchsanstalt?—Yes.

135. And I suppose, no doubt is entertained as to the utility of these institutions generally to commerce and industry in Germany?—Most certainly.

136. Do you think that utility depends upon their carrying out the particular class of work to which objection has been taken over here?—I think that circumstances are somewhat different here to what they are in Germany, and I think that the Laboratory can be carried out as to do all the work that is done at the Reichsanstalt, and that part of the work that is done at the Versuchsanstalt which will be useful to us, without any real interference with other interests here. I do not think there has been any actual interference up to the present moment. I do not think any case of interference has been proved, and I think that the Committee have all along had in their minds the difficulties that might arise through competition and interference with other interests here, and they have been very careful indeed to avoid that. I think that can be done, continuing on practically the same lines that we have worked on, with very great value to trade.

137. Are there private testing establishments in Germany?—Not so many as in England, I believe, but I am not very well informed as to that.

138. So that the difficulty that has arisen here would not be so likely to arise over there?—I gather probably not. There are in all the great works in Germany much more elaborate testing appliances than there are here, but I do not know that there are so many private individuals. There are not so many in England.

139. The large establishments carry out testing work for their own benefit?—For their own benefit.

140. But there are not so many testing establishments in Germany which carry on the work of testing for profit and charge fees?—I cannot positively reply to that question, but I should gather probably not.

141. (*Sir John Wolfe-Barry.*) I suppose these two public institutions have been in existence for a long time in Germany?—The Reichsanstalt has been in existence some 15 or 20 years, I suppose, now. The Versuchsanstalt not nearly so long. The Versuchsanstalt, as a large testing establishment, is comparatively recent. This gives an idea of the size of the institution at present (*producing picture*).

142. (*Sir Andrew Noble.*) Was that started by Siemens?—No, that was started in connection with the High School at Charlottenburg. It is still a part of the technical high school at Charlottenburg, and this testing portion has been removed from Charlottenburg comparatively lately into the country some distance away. As I said some little time ago, there is a general objection I think, taken to the State, or to a body supported by public funds, doing anything that may compete with private enterprise, and I think in a great many cases, Mr. Blount's case for example, that is very much at the bottom of the objection. There are others who are raising objections who I know take that same view. I should claim that so far as the Laboratory is concerned the benefit that arises from our work far outweighs any effects which might follow from some slight amount of competition. I believe the Laboratory has been conducted, and can be conducted, so as to make the competition a very small matter, and I think that the general benefits to trade and industry which will follow from establishing an institution on the lines that are indicated in

that Memorandum of the Executive Committee of 1904 that you have referred to, and on the lines on which the Committee has been working since 1902, will far outweigh any difficulties which may come from some small amount of competition. As I have already said, I think the Committee have been aware of the provisions of the Report, and have tried so far as they could to follow out the provisions of the Report, that is to say, avoiding tests that brought them into direct competition with the existing firms doing useful and valuable work. Practically no chemical tests have been undertaken excepting those arising out of the physical and mechanical tests that it was quite legitimate for us to do, with few exceptions, and I would go into details to establish this point if it seems necessary to do so. I have details here of all the chemical tests that have been done.

143. (*Chairman.*) Then, apart from the question of whether you have or have not rigidly observed the limitations laid down in the Report of the Committee, your case would be that as a matter of fact there has been little or no competition with private enterprise ?—Certainly.

144. And that any injury to private individuals can be easily avoided ?—Certainly.

145. Consistently with your carrying out what are called ordinary commercial tests of materials ?—A certain number. I do not think we need carry out a large number of ordinary commercial mechanical tests; I mean tests relating to breaking or bending of materials of construction. I should rather use the word "reference tests."

146. Yes, I think reference tests appear to have been clearly contemplated in the Report of the Committee, in the passage which we have already considered here ?—Yes.

147. But apart from reference tests do you think that there is a field of activity which could properly be described as the carrying out of commercial tests which you could enter without interfering in any material degree with private enterprise ?—I think perhaps it is a little important to clear up the point as to what is actually meant by commercial tests to which objections may be taken. Apart from the people who object to the Laboratory doing anything that can be called municipal trading or anything of that kind (and though I think they are very active, I do not think they are very numerous) I think the objection that is taken relates almost entirely to chemical tests and to what are ordinarily known as the commercial tests on material, that is to say, merely to the breaking tests of steel, and other things, elasticity tests, bending tests, and so on. I think it is essential for our work that we should be free to do a certain number. I will explain later why I think it is essential that we should do some; probably those which may be described as reference tests would be sufficient for the purposes I have in view, but we must be free to do a certain number of these ordinary breaking and bending tests; probably, as I said, all of the character of reference tests; this is of the utmost necessity.

148. Do you think that that requirement of yours would be satisfied if you were to carry out what you have now described as reference tests (which seems to me to be a convenient term), and also such work for Government Departments as you have hitherto carried out ?—If you apply such a limiting term not to a very general phrase such as commercial testing or such as testing of materials, but to the testing of materials as it is ordinarily understood by engineers, I mean just the ordinary tensile tests, elasticity tests, bending or breaking tests on ordinary materials used in structure, I should say yes. But if you are going to include under the limitation what you have already spoken of as commercial testing of materials, that is to say, tests on glass that is going to be used for optical purposes, tests on wires that will be used for electrical purposes, tests on steel that is used for dynamos and instruments of that kind, and similar tests to these, then I should say emphatically no.

149. But may I ask whether those tests are now carried out by private firms ?—I do not think they are carried out very much by private firms at present, but if you lay down a general rule that only reference testing and no commercial testing is to be undertaken without further specification you limit us, and you afford anyone the opportunity of saying, "Oh, I can do this kind of testing, and therefore you must not do it."

150. But so far as the class of tests which you have specially referred to is concerned, you think it would be sufficient for your purposes if reference tests and such tests as you carry out for Government Departments were regarded as within your scope, but other tests as outside it ?—The class of tests to which I have referred, being the ordinary tensile, bending, and breaking tests of steel and such materials used in construction, I should say yes.

151. And it is with regard to those really that any question of competition by private enterprise has arisen, or is likely to arise ?—Yes. May I go into the question a little more fully as to the reason why I think it is necessary that we should be allowed to test materials in the general sense ?

152. If you please.—I mean, the reason why a limit placed on breaking tests and the like should not apply to testing of materials generally. Materials, I think, must be tested to improve the instruments. I should illustrate that by a reference to the history of the optical instrument trade. It has been mentioned once or twice before, but it illustrates the case very well. Up to about the year 1873 or 1874 England was a long way ahead in the optical instrument-making trade. An exhibition of optical instruments was held in South Kensington in 1876. That exhibition was attended by Professor Abbe, of Jena, who, in his report to the German Government, pointed out that unless the materials that the opticians had to use were altered and improved, it was useless to proceed further with the efforts then being made to improve optical instruments, and that the right way of setting about the improvement was to start improvements on glass-making and to determine the optical and other properties of the various glasses in existence, to determine how they could be modified, and what alterations were necessary in order that certain defects in the lenses might be overcome. As a result of that Abbe and Schott, of Jena, started their great glass works. They were helped by the German Government.

153. (*Mr. Chalmers.*) They were not helped in the discovery, but in the manufacture subsequently ?—Not the actual first discovery, but as soon as they had shown that they could make glass which would be of real value they began to get subsidies.

154. They, by their scientific ability, did discover a thing as private individuals, and that was subsequently utilised by them, with Government assistance no doubt just for the manufacture ?—For the manufacture. The result of that was that in 1900, at the time of the Paris Exhibition, the Germans were able to make this claim. They state, "In Germany it is only within the last 20 or 25 years that the State has espoused the interest of the home industry in scientific instruments, but such have been the efforts and results, that the position has, at a blow as it were, changed in favour of Germany," and they go on to describe how large numbers of optical instruments are now made, and give some figures showing that the exports in 1898 of astronomical, optical, mathematical, physical, and electrical instruments were £448,750; raw optical glasses, £31,250; optical glasses (spectacles, &c.), £156,950; telescopes, &c., £76,300—a total of £713,250.

155. (*Chairman.*) But that was not the result of tests carried out by a Government department for fees, was it ?—They point out in this paper from which I am quoting that the work which they were doing was enormously helped by the Reichsanstalt.

156. Would not that come under the head of experimental investigations rather than testing ?—Of course that is a point on which we have not been quite clear from the beginning. You may say that all this work that I am pressing for, such as the testing of glasses for manufacturers, is experimental investigation and not testing. If a firm, for example, send us up a new glass and ask us on that to determine the optical constants, and whether it will be satisfactory for a certain piece of apparatus that is required, are we to call that testing of material, or experimental investigation.

(*Chairman.*) I think in some cases it might be difficult to draw the line, certainly.

157. (*Mr. Chalmers.*) What was the point you were making at present ?—That the testing of materials in the sense in which I am interpreting it, the rather wide sense, is necessary if our work is going to be efficient and useful for industry and trade.

158. Surely the chief point that you have made is that we have not got what the Germans have got, Professor Abbe, to discover the glass which has been the absolute foundation on which the improvement of German trade in that line has gone ?—Still, when Professor Abbe made the discovery it was open to us, if we had had the institution, to take it up and complete it, and make the necessary tests for manufacturers.

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159. They had not got an institution there at that time?—They had the Reichsanstalt.

160. My memory may be wrong, but I think they had not at the moment. But I bow to you if you remember it.—1882 or 1883. I need not go further into the question, perhaps, of reference tests.

161. (*Chairman.*) No, I think not, so far as this particular aspect of the question is concerned?—I want to say a few words, if I may, with reference to the necessity of the performance of some routine commercial test work to maintain a connection with actual engineering practice. Problems of various kinds are referred to us, and we have various investigations to make. Sometimes it may be on a new material, sometimes on something that has gone wrong. For instance, just lately we have been asked to investigate for the Board of Trade the material of a steam drum that burst in the south-west of London, and we have one or two other tests of that kind on hand. Of course we can carry out the actual measurements, but the measurements, if made by men who have no real experience of the behaviour of the ordinary materials of construction, lose a very great deal of their value. We endeavour to get men to do the test who have some experience, by selecting men as assistants who have had works experience. It is necessary for them to keep up that experience by handling from time to time the ordinary materials of construction and by seeing how those ordinary materials of construction behave, and the tests which they are going to apply, for research purposes or for reference purposes, to the new materials, lose greatly in value, unless they have the experience. I have got here a list of three tests of that kind. I can, if necessary, put them in, but I do not know that it will be necessary to do so. These are the tests made on specimens cut from the end of a storage drum, the investigation that I was speaking of. I think any engineer looking through that report would say that unless those tests had been made by a man who had practical experience of routine testing they would lose a very great deal of their value. This is another report on the physical and chemical properties of a new material, like bitumen, which was submitted to us by Sir William Preece. There, again, unless the man knew how an ordinary material, such as bitumen, would behave under the tests, the value of his tests would again lose, and so it is in all tests. Therefore I think it is necessary that all the people employed in doing reference work should be people who really know what the ordinary routine testing work is like, and what are the materials that are ordinarily used in structures and buildings, and how they behave under similar tests.

162. Quite so. You contend that if the staff is to be really efficient a certain amount of this work must be done by it?—It must be so.

163. And the staff could not keep its hand in without such work?—I do not think so.

164. (*Mr. Chalmers.*) Not even with Government work?—Of course in our case at present it is different, because we know that we are going to have a large access of Government work of a particular kind.

165. That is the point I wanted to press. I thought you rather granted, in answer to a question of the Chairman, that reference work plus Government work was enough for you?—Yes.

166. (*Chairman.*) As regards the testing of certain classes of material?—Yes.

167. (*Mr. Chalmers.*) And you adhere to that?—I adhere to that, so far as those tests are concerned.

168. (*Sir John Wolfe-Barry.*) If you hold yourself entirely to Government work and reference work, you are not then keeping abreast of the ordinary work of the engineering world. The Government work, for example, may be Indian work, and greatly circumscribed?—Yes.

169. The object, I take it, is that your staff should be kept abreast of the ordinary commercial requirements as to materials?—I was assuming that if we did do a reasonably large amount of reference work, that would probably be sufficient.

170. (*Chairman.*) I should have thought that the reference work might have been sufficiently large to keep you abreast?—Yes, that was my meaning. I was distinguishing between reference work and the knowledge the staff must require for reference problems.

171. (*Sir John Wolfe-Barry.*) If your reference work is to be thoroughly authoritative it must have reference to what is being done in the whole physical world, and not merely one department of Indian Railways?—No.

172. Take for example electrical cables, the Indian Government have not sent you any electrical cables?—I thought I had made it clear that my limitations applied merely to the ordinary straightforward mechanical tests, the breaking tests.

173. (*Sir Andrew Noble.*) You must take it in chemistry too. But if you make your reference charges high enough, that is to say considerably over the trade, you would gain and you would not interfere with the private trade. Supposing we have a reference to make to you to determine a test upon which there is a dispute, is there any reason why you should not give us that, provided your rate is a considerable percentage above the ordinary trade rate? That question applies again, I take it, to the ordinary mechanical and chemical tests for engineers?

174. Yes?—I think in such a case it would be quite reasonable that our fees should be heavy fees. But it is not possible for our fees throughout to be heavy fees. We have to face German competition.

175. (*Chairman.*) When you say you have to face German competition, do you mean that work that would go to the National Physical Laboratory will not, if you charge high fees, go to private testing establishments in this country, but will go to Germany?—Certainly.

176. Is that the case to any extent already?—It is the case to a considerable extent already. Not of course the mechanical testing that Sir Andrew Noble has been speaking of. I am referring now mainly to tests on instruments.

177. But is recourse had to Germany and France, although the fees charged by private firms in this country might be no higher than those charged in the French and German establishments?—I do not suppose that recourse is had to Germany and France to any extent for the ordinary mechanical tests to which Sir Andrew Noble's question related, and as to which the charging of high fees related, but of course applications are made to Germany and France with regard to the testing of instruments.

178. (*Mr. Chalmers.*) What instruments?—Electrical instruments and others.

179. (*Chairman.*) The complaint does not seem to have been directed to the testing of instruments?—No, I do not think it has.

180. Have you any observations to make as to the financial aspect of this question?—Of course we have understood from the beginning that we were to make the Laboratory pay, and one way of making the Laboratory pay is by doing routine test work. You cannot make the Laboratory pay very much out of special investigations. I think the only way of making a business pay, a manufacturing business for example, is to have some kind of piece of apparatus or piece of machinery which you make in large quantities in the same routine manner, and from which you get a steady income.

181. But the fees paid to the National Physical Laboratory are principally paid in respect of the testing of instruments and not of the testing of materials?—At the present moment. Of course up to the present there has been no large amount of testing of materials in the engineering sense, because we have not had the equipment to do it.

182. Supposing your present practice is continued, do you think you will be invited to undertake more ordinary commercial testing of materials?—I think it is possible that if the present practice is continued, the demands made upon us for the ordinary commercial testing of materials might be largely in excess of what they are at the present moment.

183. But at the present moment the actual abandonment of that particular form of work would make very little difference?—Very little difference.

184. (*Sir John Wolfe-Barry.*) But you would abandon the capital spent to some extent; you have spent money?—On getting a big testing machine?

185. Yes.—We should abandon that of course.

(*Chairman.*) Still, that would be necessary in respect of any work which you were asked to do by any Government department.

(*Sir John Wolfe-Barry.*) I mean so far as returns from the outside came in. I did not mean that the machine would be given away, but I meant the income from it would be abandoned.

186. (*Sir Andrew Noble.*) Do you not do ordinary breaking tests and bending tests?—We have done a limited number of those. We have only had a 10-ton machine to do them with. A 100-ton machine is on order now.

187. Where are you getting it ?—Bucktons.

188. (*Sir John Wolfe-Barry.*) If there were no question of competing with or interfering with outside people you would say that the more testing that is done the better for the information of the staff, and the better for those who go to the National Physical Laboratory for tests ?—I think that would be the case, one would enlarge the staff by people doing the test work.

189. If there were no question of interfering with or competing with private people, the more that is done there the better ?—Certainly.

190. Then comes the question how could you so do your work as not to compete with or interfere with private testing. Could that be arrived at by a scale of fees ?—It might be. I would rather doubt whether it would satisfy the people who are raising objections. It would depend of course on how much extra you charged in the fees. But they would say that people would pay higher fees to a certain extent in order to get the value of our certificate.

191. Then a person who undertakes a reference test should as far as possible be a man who is constantly at work making tests that are not reference tests, unless there was a sufficient number of reference tests to keep him wholly employed ?—Yes, I think something would depend on the definition of reference tests, of what was implied by the reference tests, no doubt, but I had thought that taking quite a fair definition one probably would get a sufficient number to give one man (or possibly two men) quite sufficient experience to make him of value for the experimental investigation work. For instance, we have been asked by one of the large boiler insurance offices if we will undertake a reference test on each of the boilers that is constructed under their supervision, probably two or three tests. There are a fairly large number of such tests.

192. I suppose those reference tests will compete with or interfere with private testing institutions ?—I am not sure about that, because I think that in most cases tests of that kind are made at the works where the boilers are made, and that the object of the Insurance Company applying to us was to check those.

193. At any rate it is to prove something which they are not quite satisfied with now ?—Certainly.

194. But that proving would compete with or interfere with private laboratories if private laboratories were brought in as independent people instead of the National Physical Laboratory ?—Certainly.

195. I think that everybody must admit that there are some passages rather difficult to reconcile in the original Report of the Committee. But in the institution by the Government of the National Physical Laboratory there is no reference to those qualifications as to what should be done ?—That is so. I omitted to call attention to that fact in answer to one of the questions of the Chairman.

196. There is no qualification in any one of the four conclusions at the end of the Report, and in the minute or letter setting up the National Physical Laboratory it is stated in the first place, " Her Majesty's Government are prepared to adopt generally the four conclusions of the Committee as set forth on Page 6 of the Report." And that is entirely without qualification as to interfering with private enterprise.

197. (*Sir Andrew Noble.*) That is for testing materials ?—Yes.

198. (*Sir John Wolfe-Barry.*) The Chairman has spoken a great deal about the qualifying paragraph, but that qualifying paragraph is passed by altogether ?—So far as the formal letter is concerned.

199. The Railway Companies are considerable subscribers to the National Physical Laboratory ?—Certainly.

200. Supposing a purchaser wants to satisfy himself that he has got the material which he thinks he is entitled to, he can at present either employ a private testing establishment or the National Physical Laboratory ?—Yes, as far as our equipment permits.

201. And at the present time the Laboratory would not refuse those tests if they had the equipment ?—Except in the case of chemical tests.

202. Therefore the alteration that is asked for is that the Executive Committee should refuse those tests, whoever asks for them ?—I suppose so.

203. Then do you think that, supposing there is a small interference now with the private establishments, that small interference might be made considerably smaller if the fees of the National Physical Laboratory were always kept above the fees of the private establishments ?—Certainly. You are speaking, of course, of the ordinary engineering tests ?

204. The ordinary engineering tests, yes.—Certainly.

205. Or take the case of cement or anything of that kind, the same remark would apply ?—Yes.

206. (*Chairman.*) How do your fees compare now with those charged by private establishments ?—I think they are much on the same scale, possibly a little higher. It is not easy to get the fees charged elsewhere. I should like to refer to one fee that may be referred to in evidence later. It is the fee for an ordinary breaking test. That fee, as quoted in one of our earlier Pamphlets, is distinctly less than what is charged by the ordinary private firms who do the work. But that was done in view of the fact that we only had a 10-ton testing machine, and could practically only test wire, whereas the fee that is ordinarily quoted is the fee for a 50-ton or a 100-ton testing machine. So that the comparison which has been made that we quoted a less fee than persons outside is not a fair one, because our fee only referred to what may be called almost a toy test.

207. In general your fees are on about a level with those of private firms ?—Yes.

208. And you see no reason against the suggestion made by Sir John Wolfe-Barry that they should be raised ?—Limiting it only to these mechanical tests, I should agree.

209. (*Sir Andrew Noble.*) And the chemical also ?—The chemical, yes.

210. (*Sir John Wolfe-Barry.*) There are other matters. A man wishes to investigate different alloys of metals. He can if he likes now go to either the National Physical Laboratory or to a private establishment ?—Yes.

211. But supposing he gets his analysis on his alloy and its behaviour, will not he then have a much more authoritative thing in his possession than if he has it merely from a private establishment ?—I should think he would, and I should like to point out in that respect the great advantage that there is at the Laboratory in having a large number of departments under the one head. An investigation of that kind would quite possibly require, as indeed these investigations which I have already brought before you require, the mechanical, or it might be the chemical, the metallurgical, the thermal, and the electrical departments combined.

212. It probably would in anything new in the making of alloys ?—Yes.

213. But to an extent again it would interfere with the private establishment ?—Certainly.

214. But it would be very much to the benefit of the public, would it not ?—Certainly.

215. Then, again, take railway companies buying very large quantities of materials, if they feel disposed to pay for an authoritative decision from the origin of things as to the materials they are buying, is not it a question then which the National Physical Laboratory would be able to speak upon with far more authority than a private establishment ?—I should think so, within a little time.

216. So as to avoid disputes rather than to lay the ground for disputes ?—Certainly. I should think in a little time there can be no doubt that would be the case.

217. Therefore the sole objection which appears to be urged against the National Physical Laboratory being free is that they may compete with or interfere with private establishments ?—I think that is all.

218. And against that has to be considered the interests of the general public ?—Certainly.

219. (*Sir Andrew Noble.*) When I was in Germany, I made some enquiries about the Reichsanstalt and how that was viewed by German manufacturers. I daresay you did the same, and if you did will you tell me what the view of the manufacturers was ?—As far as I have gathered there is a unanimous consensus of opinion throughout Germany, and not throughout Germany only, that the work of the Reichsanstalt is of enormous value to German trade and manufacture. May I give one instance of that that has come to my knowledge just lately ? The representative of one of the largest electrical instrument constructing firms in England was at the Laboratory a few days ago, and he told me that he had been enquiring how it was that his goods did not meet with so good a sale in America as they had some little time past. He sent to me (and he is prepared to show it to the Committee, I believe, if the Committee wish to see it), a copy of a letter from his American agent, which was to the effect that the Germans now had the most of the trade, because they had the

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Reichsanstalt behind them, and the instruments and the materials came into the country backed with a certificate at which nobody could cavil.

220. I was in ignorance on the point that there were many private people in London who did tests. I only knew of one man in London who made tests for engineers. Did they make complaints?—I have not heard directly any complaints from people who themselves are actively concerned in making tests. You, I think, are speaking with regard to mechanical tests?

221. I am speaking with regard to mechanical tests?—I think the number of persons concerned in the mechanical tests is very small. There are only two or three firms, I think, that do them. Then I would point out that the University Colleges, I think, throughout the country, do these mechanical tests quite freely, and charge fees for them. I should not like to say all, but certainly a large number of the University Colleges throughout the country do these mechanical tests just exactly in the same way as we do; and there are certainly not more than three or four private firms doing them. But there are a large number of private firms doing chemical work.

222. Oh, yes. We have a considerable laboratory ourselves, but at the same time it is very desirable that we should be able to make reference tests. That was the point I wanted to urge, and that I do not care what fee you charge, whatever the percentage would be above the others to prevent your competing with them. But there are certain advantages we can have from going to you which we cannot have from going to a private analyst?—Yes.

223. (*Sir John Wolfe-Barry.*) Could you give us any list of the University establishments that do the tests for fees?—I have not got one, but I daresay it could be obtained.

224. (*Mr. Chalmers.*) About a dozen, I should think?—I should think so, but I have not a list.

225. You think it would be a great advantage to our trade if our traders could say that their instruments or materials, or both, had been to the Physical Laboratory?—I have no doubt about it, but I trust the Committee will take evidence in some way or other from persons who have already made use of the Laboratory.

226. I mean they would sell more if they got that?—Yes.

227. Consequently, so far as fees are concerned, a private person would not be able to compete with them, even if there were an increase of fees as was suggested by Sir John Wolfe-Barry. Is not that so? There would be a government stamp?—The advantages certainly would be great.

228. You will be able to do a considerable amount more testing as soon as you have got your new equipment installed?—Certainly.

229. Of the kind that has been called commercial testing?—Engineering commercial testing.

230. At the moment you are not able to do as much as you will be able to?—Certainly not.

231. Going back further, when the Report of the Committee was produced there was perhaps a certain ambiguity as to whether or not it did include any testing of materials in the existing sense?—Yes, it appears so now.

232. You will remember that a body of eminent physicists, of whom you were one, waited on Lord Salisbury about the 16th February, 1897, to urge that a National Physical Laboratory should be established?—Yes.

233. Do you remember if there was at that time any mention made of any testing of materials?—I could not say.

234. I think I can refresh your memory as a matter of fact. May I remind you of what was said by those distinguished physicists at the time when the Government was approached to provide funds. "Certain types of investigation have been recognised both in this country and abroad as lying outside the range of effort possible either to an individual or to the great teaching Universities or Colleges. These may be divided into three principal classes, namely (1) The observation of natural phenomena, the study of which must be prolonged through periods of time longer than the average duration of life; (2) The testing and verification of instruments for physical investigation and the preservation of standards for reference; and (3) The systematic accurate determination of physical constants and of numerical data which may be useful either for scientific or industrial purposes." The point I want to make is that there is no mention of anything except the scientific aspect of the thing at that time?—At that time.

235. A mere matter of growth?—Yes. The result of that was that a Committee was appointed, the Committee that reported in 1898, and took a large mass of evidence, and it appeared from that evidence that the testing of materials was necessary in certain ways, and was of importance. So that the Report of the Committee probably included rather more than the idea of the physicists who first approached Lord Salisbury.

236. There was nothing in their remarks to Lord Salisbury, and there was nothing in the reference to the Treasury Committee of 1897 on the subject of the testing of materials?—I think that is so.

237. I merely want to point out that this has been essentially a growth, as shown by the utterances of the physicists themselves. I do not know if you remember a remark made by Sir John Wolfe-Barry when he went to the Prime Minister. According to the *Times*, he said, "He felt very strongly that every branch of applied science was greatly in want of such help to its development as would be given by the establishment of a scientific laboratory of research"?—Yes.

238. I am just trying to make it clear that the basis of the thing was purely scientific, except so far as the standardising of instruments was concerned?—Yes. May I, however, refer to another clause of the Report. My attention has been called to it by what the Chairman said, and in reference to some questions that you put to me at an earlier stage. It is Clause 13, and perhaps what I am now saying ought to have come in in connection with those questions. "The testing arrangements of the Physikalisch-technische Reichsanstalt and of the Mechanisch-technische Versuchsanstalt at Charlottenburg are far more complete than those at present available in this country, and the Committee understand that not infrequently English manufacturers are compelled to apply to these institutions for certain tests. Further, there is reason to believe that the fact that investigations of the highest order are conducted in these institutions gives a greatly enhanced value to the certificate that they issue."

239. (*Sir John Wolfe-Barry.*) It is like a hall mark?—Yes.

240. (*Chairman.*) That of course might be held only to refer to those forms of testing which the Committee undoubtedly reported in favour of, the standardisation and verification of instruments and so forth?—Yes.

SECOND DAY.

Thursday, 21st March, 1907.

PRESENT:

The Right Hon. GERALD W. BALFOUR (*Chairman*).

Sir ANDREW NOBLE, Bart, K.C.B.
Sir JOHN WOLFE-BARRY, K.C.B.
Mr. ROBERT CHALMERS, C.B.
Mr. G. C. UPCOTT (*Secretary*).

Sir WILLIAM RAMSAY, K.C.B., F.R.S., called and examined.

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241. (*Chairman.*) You are, I believe, Vice-President of the Institute of Chemistry of Great Britain and Ireland ?—Yes.

242. In that capacity you last year made representations to the Treasury complaining of the practice of the National Physical Laboratory with regard to the testing of materials ?—Yes, that is so.

243. I think the grounds of the objections which you raised have been stated in the letter which you addressed to the Treasury on the 9th of April, 1906, and in a further letter on the 3rd of January in the present year ?—Yes.

244. Those letters I may say have been communicated to us by the Treasury, but perhaps it would be for the convenience of the Committee if you would develop the grounds of your objection somewhat more fully ?—I may state that those letters were signed by me in the absence of the President, who ought to have signed them. He was in the country at the time, so that I merely signed them as Chairman of the Committee and not as President of the Institute. I think the grounds are very largely given in that note that I have sent up to you.

245. Then perhaps we had better take this *précis* of the evidence and go through it ?—That would be the most convenient way, because I think it raises all the points.

246. The first point raised I think, is as to what was meant by the report of the Committee of 1898 ?—Yes.

247. That is by the phrase "Testing of materials" ?—Yes, the whole question turns on that.

248. Would you state your interpretation of that to the Committee ?—There are two points of view; the chemical point of view and the engineering point of view. The chemical point of view is more familiar to me, and I am subject to correction in regard to engineering matters. The chemical point of view is this, that supposing an analysis is carried out for anyone who sends the material in with the object of having the analysis done for a trade transaction, say, then I should regard that as contrary to the spirit of the Committee's report. It might be put very shortly in this way: such an analysis should not be carried out as to the definite value of a certain sample, that being the same kind of work that the ordinary analyst undertakes. If on the other hand the material is sent in for analysis with a view to bettering a process, or, what is still more within the scope of the sanction, if it is in order that researches should be undertaken with a view to developing processes, then the case is different. For example, an analyst has a certain problem brought before him in the course of his business. I will take a specific instance, because it is easier to explain. Imagine that he gets a sample of a mineral containing both barium and strontium, and it is required to find the amount of strontium in it; he has to rely on the best possible methods at present in use, but as a matter of fact the analyst may study the question if he is conscientious and has time; he will improve the process, and if possible publish his results for the common weal. That is the sort of work that should be undertaken by the National Physical Laboratory. It is work which an analyst undertakes outside his common practice.

249. (*Chairman.*) You are now speaking of the general merits of the question, but would it not conduce to clearness if you first take the question whether the National Physical Laboratory have or have not exceeded the limits which were intended to be laid down by the Committee of 1898?—Might I choose two or three specific instances ?

250. Yes ?—Take the cod-liver oil case, which is familiar to you perhaps; need I go further than that ?

251. We should all like to hear the cod-liver oil case, but I think it would be conducive to clearness to go into the question of the terms of the report before going into details as to particular cases ?—Very well, may I then just read the Report of the Committee of 1898 ? Paragraph 9 says: "It would neither be necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories; but there are many special and important tests and investigations into the strength and behaviour of materials which might be conducted with great advantage at a laboratory such as is contemplated in the reference. As illustrations we may mention investigations into the behaviour of metals and other substances under continuous alternating stresses, which investigations are not, so far as we know, conducted at the present time at any testing institution in this country, and which could only be undertaken with satisfactory and authoritative results at a public laboratory. There are other investigations, such as those into the strength and durability of metals, as influenced by alloying, which are of great importance in connection with the industrial interests of this country, and which would fall very properly in our opinion, among the duties of a public institution. Again, the pressure of the wind on surfaces of different areas and shapes is a subject which demands public investigation, and which, though it is a matter of great importance as affecting structures, has never been, we believe, authoritatively determined. We could give other instances of the same nature, and have merely referred to the above subjects as examples of such matters as would, in our opinion, be proper for investigation at a public institution as distinguished from the ordinary testing of materials used in commerce or in construction and machinery, which can be and is now efficiently conducted at private establishments." Those are quotations from the ninth paragraph of the Report of the Committee of 1898.

252. What do you make of the sentence immediately before the one to which you have called my attention in Paragraph 9 of the Report. In fact, take the first two sentences in that paragraph ?—"There is much evidence that further facilities are needed by the public for the standardizing and verifying of instruments, both for scientific and commercial use; and also that it would be of great benefit to trade if means were provided for the public testing of the quality of certain classes of materials." That I think refers to the utility of the experiments. They can be made by private people.

253. Then the next sentence ?—"In particular the Committee desire to draw attention to the evidence which has been laid before them as to the difficulties arising in certain Government Departments in their dealings with contractors and others which might be overcome by the establishment of an independent testing authority."

254. Does not that clearly so far as it goes refer to the testing of samples or the testing of materials ? The

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sentence you first read out is not intended to qualify and limit reference testing of that kind.—Would not you take it that that work can be done for the Government? The Government does not usually employ a private analyst to do its own work, and in that sense they would be experts for the Government.

255. I should think not. The natural interpretation appears to me to be that difficulties may easily arise which require an authoritative decision by an authority which stands outside and which will be recognised on all sides as an impartial authority. That is what it seems to me to mean, and for that purpose it was recognised by the Committee that the testing of materials might be useful?—I do not think that is the reading of it which is generally understood.

256. But is not that the natural interpretation of it? It says "arising in certain Government Departments in their dealings with contractors and others." I believe I am right in saying that Sir Andrew Noble was responsible for that sentence?—Yes.

257. (*Sir Andrew Noble.*) Yes, I am responsible for that, and I might say to Sir William Ramsay, shortly, I think that as regards my own case I have never gone to the National Physical Laboratory, or, at any rate, I think I have been only two or three times to that, because I was stopped. We have with the Government frequently, as between our own analysts and the Government analysts, a considerable difference. I will just mention one case. We had a serious difference as to the quantity of carbon in steel, as to which the Government are particular. Their analysis differed materially from ours. I sent to Messrs. Stead a sample from the same piece of steel that the Government had given an analysis of, and another to the National Physical Laboratory. Messrs. Stead and the National Physical Laboratory were practically in accord with us, whereas the Government analyst was very different. The Government do not recognise our analyst or any other analyst, but if we had the power to go to an independent Laboratory like the National Physical Laboratory, and it was under the Government's ægis, then in that case we should have a case in which we might dispute it with the War Office or the Admiralty, as the case might be, and they would recognise the National Physical Laboratory. It was not at all an object, as the Chairman has pointed out, to interfere with private trade in any way, but simply to have an authority to whom we could appeal?—Just so.

258. (*Mr. Chalmers.*) But that would be a matter of the contents of the contract, would it not, and whether it provided an appeal or not?—Yes. But do not you think that is a counsel of perfection? The salaries that are paid in the National Physical Laboratory run up to £500 a year, and do you expect an expert in steel to be content with so little? There are in the National Physical Laboratory a number of young men in the process of training, whose evidence you cannot trust.

259. (*Chairman.*) But if you will pardon me for saying so, that is an argument which may be perfectly sound in reference to the merits of the case, but our first concern is with the meaning of the Report. The question before us now is whether the Report did not distinctly contemplate reference testing of materials, as I would call it?—Evidently from this it does—from an independent testing authority.

260. (*Mr. Chalmers.*) In what cases should you say it would be?—It was meant to be only in cases of dispute, I should say, between contractors and others.

261. Would it mean between Jones and Smith, or Smith and the Government Department?—Smith and the Government Department.

262. (*Sir John Wolfe-Barry.*) Exactly the same thing happens between Jones and Smith, of course?—Yes.

263. (*Chairman.*) Take the case where the two parties to a contract agree to abide by the decision of an independent authority as regards the testing of a particular material, and they agree that the Government Laboratory would be the best authority available. Do you think that the Report did not distinctly suggest that the National Physical Laboratory might usefully fulfil that function?—No. But a separate institution might very well do so in the case of persons contracting. For example, millers are continually having arbitration cases because the samples of corn do not answer to the statement of the vendors. Those cases are every day submitted to arbitration, and no doubt in engineering the same thing could be said. If a Government Department is constituted to include all such cases, there is nothing against it, in my opinion. It would be a special court of appeal. I do not understand this to be the function of the National Physical Laboratory, however.

264. The mention of the Government Department in that particular sentence is further due to the fact that Sir Andrew Noble had in his mind a dispute between his firm and a Government Department?—There are such disputes.

265. (*Sir Andrew Noble.*) Yes. We do not have these disputes with private contractors. The Government are much more dictatorial, and whatever they say is law.—But remember it was really limited to Government Departments.

266. (*Chairman.*) This sentence refers to a Government Department undoubtedly.—Yes.

267. (*Mr. Chalmers.*) What is your view as to what that sentence in the Report of the Committee of 1897–98 actually means? Does it mean Smith and Jones?—No, it means a dispute between Smith and the Government Department.

268. That is carrying out the intention that Sir Andrew Noble has indicated as being in his mind in regard to that sentence?—Yes. It gives them the position of Government experts. I think I am representing the view that is generally taken in saying that this refers only to the National Physical Laboratory taking the position of Government experts.

269. (*Chairman.*) There is no doubt it must be admitted that Government Departments are distinctly mentioned in that sentence?—Yes.

270. There is nothing in that sentence, I think, to exclude the National Physical Laboratory from acting as arbiter or referee in other cases of dispute. But undoubtedly Government Departments are mentioned?—I should think the next sentence excludes other cases, for it is the commonest thing in the world for an eminent analyst to be employed as arbiter. In almost all cases three analysts are employed. One is an analyst of the buyer, and another of the seller, and in cases of difficulty a third analyst is called in; if this work were done by the National Physical Laboratory it would be interfering with the work of private and other laboratories.

271. Taking that last sentence, the force of which I am sure no member of the Committee will desire to extenuate, it says: "It would be neither necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories." That raises a question as to which I should like to have your view. The point there is that competition with work now done in private laboratories is to be avoided. Would you consider that any testing of materials which is not now carried out in private establishments, or which was not carried out in private establishments at the time the National Laboratory was founded, would be legitimate under the terms of this Report?—The "now" does not refer to the kind of material, but to the test being carried on in private laboratories. It is not the kind of testing, but the fact of its being now carried on in private laboratories that is referred to.

272. Is that so?—It appears to me to be so.

273. The words are, testing of materials of various kinds as now carried on in private and other laboratories, but I should imagine some kinds of testing are not carried out in that way?—Private laboratories could undertake such testing.

274. But that raises an important point, for the object is to avoid encroaching upon private enterprise as actually carried on. The objection would not apply in cases where that enterprise had as a matter of fact not yet entered the field?—You make the "now" refer to the testing, but I make it refer to the fact of the testing being carried out. It is a question as to what that adverb refers. "As now carried out," means according to the common custom and does not refer to the particular materials which are at that particular time being tested when they have to be tested.

275. But if there are different classes of materials?—It has nothing to do with materials. It is the habit of testing.

276. Then that would exclude every form of testing?—Yes, it would exclude every form of testing.

277. That is to say, that under the terms of the Report the intention was not merely that private enterprise should not be interfered with, but that certain fields of activity should be permanently left to private enterprise whether it had already occupied them or not?—Yes. Might I

state the whole case in this way, because we are rather arguing round the question. It is absolutely impossible to draw a clear line as to the kind of instrument to be tested. For example, thermometers have been tested for ages at Kew, and nobody has objected. Are you going to test electrical machines in that way? If you test electrical standards you distinctly interfere with the business of those people who do the same thing, and inasmuch as a Pamphlet is issued giving prices which are less as a rule than the prices charged by the best private testers, you interfere with this work. But I admit it is exceedingly difficult to draw that line. Where are you going to stop in testing instruments? I think the line should be this, that where an instrument is to be used as a standard, then it may be tested, but if it is merely to be sold, then it is different. It is very difficult to draw the line.

278. (*Mr. Chalmers.*) What about a watch?—It is both a standard and to be sold.

279. But that principle would condemn all the work done at Kew in the standardising of thermometers?—I know it would, but at the time when Kew took up that work nobody else was doing it. It was an advantage for the public and for instrument makers, and nobody objected to an instrument being tested; but now Bushy House steps in and undertakes a work which is in the hands of the professional public and cuts prices in a manner which the professional public does not like.

280. (*Sir Andrew Noble.*) Do they undersell?—I am told so, but I am not a practitioner myself.

281. (*Chairman.*) I take it that on this point of what is actually meant by, and what is the true interpretation of, the Report you hold that the Committee intended to prevent the National Physical Laboratory from undertaking any testing work on materials except so far as they might be called upon to be referees between the Government and some private firm?—Yes, that is so.

282. And that even as regards work which is not now undertaken by private testers, still if it might conceivably be undertaken by them the National Physical Laboratory was to be precluded from engaging in it?—Yes, that is my view. I think it might be expressed in another way. I am getting drawn into talking of the standardising of instruments, but I would rather take the chemical side of the question. The Laboratory is at liberty to test processes. It is not at liberty to test samples. Therefore it is perfectly easy to draw the lines on the chemical side.

283. Now I pass from the question of the interpretation of the Report of 1898 to a statement which you have made here in your *précis* of evidence where you say "The Pamphlet issued in 1903 and again in 1906 contravenes this recommendation"—that is the recommendation of the Report—"again and again. The Pamphlet is unprofessional and an analytical chemist who issued a Pamphlet containing matter such as appears on page 40 of the November, 1903, edition would be, if he were a Fellow of the Institute, censured"?—Yes, that is so.

284. Then you say "It is true that this has been modified in the 1906 edition"?—Yes.

285. "But if a single physical test is applied to any article submitted it is to be understood that a complete chemical analysis can be made and charged for." Would you explain to the Committee what is meant by saying that the pamphlet is unprofessional?—As to this statement, if it were issued by a private individual, under the heading of fees he would say that the analysis is generally charged for at so much, say, a guinea, and half a guinea, and so on. I come a great deal into contact with persons who charge fees, and the general practice is that it is supposed to be professional for an analyst to issue leaflets to his clients, but not to other people's clients. If he does that, then if it becomes known, he is censured by the Institute of Chemistry. His conduct is regarded as unprofessional. On the other hand it is not so in America, where you find doctors advertising special cures in the daily papers. We regard people who do that in this country as quacks. Professional chemists who do that are informed that they are breaking the contract which they made with the Institute of Chemistry when they were admitted as fellows. It is simply contravening professional etiquette. You may argue that that professional etiquette should not exist; it does exist, and we have to keep up the status of the chemical profession, and chemists are responsible to the public in the same way as medical men are.

286. But does the unprofessional character of the act depend on the fact that the National Physical Laboratory circulates these pamphlets?—Yes, and a statement of fees. I am informed that these fees are about half the fees that would be charged by the best class of private analysts.

287. That is a point on which I should certainly like to have your views. I do not think it is the intention of the National Physical Laboratory to interfere with private business by charging lower fees?—Just so.

288. (*Sir John Wolfe-Barry.*) Possibly you do not know that of your own knowledge?—I am only told so. It depends on who the analyst is.

289. (*Sir Andrew Noble.*) It was not so in my case?—No? I had a case pointed out the other day (I am only giving this secondhand) which had to do with engineering standards. It had reference to the insulation of cables mentioned on page 12 of the edition of 1906. A guinea is the usual fee for that. That is a particular instance that was mentioned to me.

290. (*Chairman.*) So far as chemical tests are concerned, you believe the fees to be low?—Yes. They appear to me to be all so low. The actual statement here of the charges made for the analyses for alloys shows they are distinctly low. But putting that out of the question, the fact of advertising in that way under Government ægis is regarded by the Institute of Chemistry as unprofessional, and would be regarded as such in a private individual.

291. It would not be open to a private individual to advertise?—No; he might send a circular to his previous clients, but not to the general public.

292. It would be really contrary to professional etiquette?—Yes; we are continually finding every year two or three cases of persons who have to be remonstrated with for advertising in the newspapers—either in the professional newspapers or others.

293. In the edition of 1906 you say it has been modified?—Yes, there is nothing said about fees in the 1906 edition.

294. Except that the fees will be according to the scope of the work and the time occupied by the examiner?—Yes, it has been modified and is less objectionable now.

295. The modifications introduced into the 1906 edition were, I think, suggested?—It was suggested that modifications were necessary.

296. By some chemical society?—By the Institute of Chemistry.

297. Do they meet your views?—Yes.

298. You think that the changes now made would prevent that kind of abuse, as you regard it?—One difficulty is that this sort of thing can be done—a manufacturer who wishes to have a chemical analysis made may send to the National Physical Laboratory and be told that the analysis cannot be made except as an accompaniment to physical tests; he may say he wishes to have some small physical test made, and so evade the restriction.

299. But have you any reason to suppose that it is as a matter of fact evaded?—No, I do not know that it has happened.

300. I understand the difference between the edition of 1906 and the edition of 1903 consists not merely in the fact that in the edition of 1906 fees are no longer specified, but also in this, that the 1906 edition makes it perfectly clear that analytical work in connection with materials to be sent to the Laboratory will only be undertaken when tests other than chemical and tests other than physical which are usually included in chemical examinations, are made?—It is better. I merely point out that it may be evaded, but I cannot give any instances where it has been evaded.

301. If the National Physical Laboratory acted up to the spirit of the statement in the 1906 edition of the Pamphlet would that satisfy you?—That would satisfy the Institute of Chemistry.

302. (*Mr. Chalmers.*) As to fees?—As to fees; they are not mentioned here.

303. No, but that was the point I think?—I was dealing with the fee point before, but that fee point is clear.

304. Would you be satisfied as to the fee point?—I think so.

305. (*Chairman.*) You consider that private analysts would no longer be liable to suffer in their business by the work of the National Physical Laboratory if the spirit of this statement is acted upon by the Laboratory?—As regards chemical analyses, no. It was pointed out to me, and of course I know it personally to be true, that a large number of analysts are in the habit of making engineering tests. For example, they may test the breaking strain of cements, and carry out various tests of the elasticity of materials. Mr. Stead, for example, does not confine himself

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to the mere analysis of steel but he applies other tests, and it is to be presumed that the National Physical Laboratory would do similar work. That of course would interfere with only a very small number of people.

306. Do you know to what extent the National Physica Laboratory has as a matter of fact invaded the sphere of private enterprise in the work of chemical analysis?—Only in three or four specific cases, so far as I know.

307. I suppose the actual amount of harm done to private individuals is up to the present moment infinitesimal?—It is infinitesimal.

308. What the Institute is apprehensive of is rather what may be done in the future than what has been done in the past?—Yes, it is.

309. And you think you are now sufficiently protected if this statement of the 1906 Pamphlet is acted up to in the spirit?—I think chemists would be satisfied then.

310. As to fees, do you think you could get us any evidence to show whether the fees charged by the National Physical Laboratory are less than those charged by professional men generally?—I could easily get the evidence, but not at first hand, because I am not in practice and all I can do is to ask people who are.

311. Could you, as Vice-President of the Institute, obtain evidence of that kind for us?—Perfectly easily, and I will make a note to remember to do so.

312. You say in your *précis* that the Government certificate is sought after, and has value?—Naturally, because it is a Government certificate.

313. You mention the following curious result as having been told you in confidence. A man wants the certificate. He sends his article to be tested and at the same time he sends a duplicate sample to an expert in Victoria Street. If the experts differ he makes no use of the certificate, if they agree, he uses it?—Yes.

314. What is the exact moral which you draw from that?—That they do not trust the National Physical Laboratory as analysts, though they want their certificate. That brings up the point I mentioned before. There are very clever young men working at the National Physical Laboratory, who are learning their work, and analysts say at present there is no fear of competition because nobody believes in them; however, they are clever fellows, and many of them do excellent work, but there are several cases in which they have failed. For instance, there is the cod-liver oil case, in which the National Physical Laboratory got into trouble with Dr. Thorpe. I do not know whether you know the details of that case.

315 (*Sir John Wolfe-Barry.*) I have not heard of it?—That was the case of a man who was prosecuted for adulterating cod-liver oil. He appealed to the National Physical Laboratory to give a certificate. An analysis was made there, and his cod-liver oil was declared to be unadulterated. The referee was Dr. Thorpe, and Dr. Thorpe found the sample to have been adulterated. The result was a collision between Dr. Thorpe and the National Physical Laboratory, in which Dr. Thorpe protested against the action of the Director of the National Physical Laboratory.

316. (*Sir Andrew Noble.*) The samples were the same, were they?—The samples were the same. The simple fact is that Dr Thorpe's men have been doing that work for years and years and here was a young man who had done it for the first time. Another case in which I will not mention names, was this. A man sent a sample of copper to the National Physical Laboratory to be analysed. It was analysed by them, and he analysed it himself and also sent it to another analyst of high standing, and the two analysts' results agreed perfectly, but the analyst at the National Physical Laboratory was apparently learning his work.

317. My experience has been better.—But at the same time these young men will improve. They are clever young men who are learning the business of analysts; that is the state of affairs at present.

318. (*Chairman.*) An interesting point is raised by what you now say, because it appears that in spite of the fact that the Government analysis is not altogether trusted as compared with that of certain high-standing professional firms, nevertheless a high value is placed upon the Government certificate?—Yes.

319. Now put out of sight for the moment the question of whether the analysis of the National Physical Laboratory is or is not one to be depended upon, and let us assume that it is to be depended upon, and that people are willing to pay, and possibly to pay a high price for that certificate, do you think that it should be rendered impossible for them to obtain a Government certificate even if they are willing to pay a very high price for it?—I think it puts the National Physical Laboratory in a very awkward position. Supposing an analyst makes a mistake in that way, his reputation goes down at once.

320. (*Mr. Chalmers.*) A private analyst?—A private analyst. It depends on how widely it gets known. If mistakes were frequently to be made, the certificates of the Laboratory would lose all value. After a few mistakes of that kind that would be the result.

321. (*Chairman.*) But the public have a desire for the certificate, and a commercial value attaches to it?—Yes.

322. Let us assume the certificate is one that can be absolutely depended upon, do you think it is desirable to make it impossible for the public to obtain the Government certificate, even if they are willing to pay a much higher fee for it than the professional analyst would charge?—In the case of a watch or thermometer, it is a good thing.

323. (*Mr. Chalmers.*) Take steel?—In the case of steel, I think not. It would be a mistake. But that is opening the question of standardisation again. The whole thing lies in a nutshell. My view, and the view of all chemists, is that there is much to be done which could be done better in the National Physical Laboratory than by a private individual who has no time, or little time, to do research work. The Laboratory is going entirely out of its way in testing samples or particular instruments for sale. The investigation of the improvement of instruments and processes is what the National Physical Laboratory is intended for, and if it does not do that it is failing in its work.

324. (*Chairman.*) But is not it possible for the Laboratory to do both?—No, not well. It will be overwhelmed with business, and it will be impossible for it to carry out investigations satisfactorily.

325. It will be overwhelmed if it charges lower fees?—It will always be so, whether it charges lower fees or not, because the Government certificate is of more value than that of a private person, simply because it is the Government certificate.

326. (*Mr. Chalmers.*) Is it a fact that it would be unable to do its research work? Is that suggestion based upon the idea that the fees would not be more than remunerative for the man who does the work, and might not he be able, in fact, putting the argument the other way, to do more research work and more commercial testing, seeing that out of commercial testing you get a profit which could be used in addition to the Government grant?—Of course, more money would be earned. I think I have touched sufficiently on the question of fees. If the fees are insufficient, then apply for a larger Government grant.

327. (*Chairman.*) But does not your argument really assume that the staff of the Laboratory must remain the same, and is not susceptible of enlargement? It is quite true that if you have a staff strictly limited in numbers, and you give them all one kind of work to do, you will thereby prevent them from doing another kind of work, but have you not excluded the possibility of enlarging the staff?—Then are you willing that the work should be undertaken by persons who are of the standing of mechanics, and are you willing that the processes should be so elaborated that it becomes merely mechanical, and that the results in question should be turned out as thermometers are tested, by boys, namely?

328. (*Sir Andrew Noble.*) That does not apply to some thermometers?—It does not apply to some thermometers.

329. (*Sir John Wolfe-Barry.*) Taking clinical thermometers they are done in very large batches?—Yes, and anybody can do them.

330. But I do not suppose more than a small percentage of clinical thermometers that are used bear the Kew mark?—I presume not.

331. But the Kew thermometers have a very high value in the market?—Yes, but there is no question that their testing has been done by some trained mechanic.

332. It is systematised?—It is systematised.

333. (*Mr. Chalmers.*) But surely you cannot press the point that testing would exclude research?—Very largely.

334. It depends on the fee you charge?—May I say that if you are going to take up the energies of your better men in looking after a large business they will have no energy left to carry out researches.

335. (*Sir Andrew Noble.*) But it cannot be a large business ?—It cannot help being that if you are going to compete with the private practitioner.

336. (*Chairman.*) Up to the present time the Laboratory has carried out the very testing work which you regard as objectionable, but it has not been overwhelmed with that work of testing ?—It has not yet got to the knowledge of the public.

337. And that although according to your account the fees charged have been below those ordinarily charged by professional men ?—The answer is, firstly, that it has not yet reached the knowledge of the general public, and secondly, there is still a lack of confidence in the results of the National Physical Laboratory.

338. Do you think if fees very distinctly above those ordinarily charged by professional men were charged by the Laboratory the same danger would not exist ?—No, probably not, because then the Laboratory would be regarded merely as a Court of Appeal.

339. Might not that be a possible solution of the difficulties which have arisen ?—If the fees are higher it will serve as a Court of Appeal.

340. Might not that be a possible solution of the difficulty which has arisen ?—I still think it is the wrong work for the Laboratory to do. It is giving the Laboratory a kind of work to do instead of the work which it would be much better employed in doing. There are many problems in improving processes and methods which must be tackled, and which the National Physical Laboratory was started in order to tackle, and to waste time on mere mechanical tests appears to me to be a mistake.

341. What is your answer to the argument put forward that in order to perform research work the experience which is acquired in ordinary routine work is, if not necessary, at all events highly desirable ?—I do not think it is necessary. To test any single instrument will give a man as much knowledge as he would gain in testing a thousand. All experiments can quite well be made with a single instrument. The other day I saw a lot of thermometers which registered by radiation. To test one of those would have taught just as much as to test 30 or 40.

342. (*Sir Andrew Noble.*) In thermometry they are very much behind in this country ?—Yes ?

343. In regard to a certain instrument connected with some work that I had to do, which required reading to the thousandth part of a degree, I was not able to get a single thermometer of that sort, or even a thermometer that would go to a very high temperature, say, above 600 degrees Fahrenheit, in this country, and I was obliged to go to Germany for everything. Now that is very humiliating. I obtained for the National Physical Laboratory the only hydrogen thermometer in this country, simply because there was none in this country.—Dr. Harker can do excellent work in that way, but his time is taken up in doing precisely the work which you are trying to suggest he ought to do, that is, in standardising a large number of instruments, from which he learns nothing after he has standardised one. He is an extremely good man at investigation.

344. (*Chairman.*) Is not that truer of the standardising of instruments than of the testing of materials ?—Probably it is, but in testing materials improved processes are wanted, which are more rapid and more accurate.

345. You were saying yourself these young men at the Laboratory were learning their business by carrying out this very work of routine ?—Yes, but I think it would be better if they learned their business in making investigations. It would be much better if they were employed devising new processes.

346. You end up, I think, by saying that there is a remedy for the present condition of things, and that is that an advisory board of practising engineers and chemists should be instituted, and you say, "many problems await solution and could be brought forward by the members of such boards ; and the work of the National Physical Laboratory would move in useful channels, while competition with private persons would be avoided." Have you anything to add to that statement ?—Yes, the Society of Public Analysts has of recent years drawn up a pamphlet in which certain problems for solution are stated—of course, naturally, dealing with their particular profession. There should be better and more rapid methods of carrying out certain estimations. Certain of those problems have been communicated to the chemical departments of colleges, and the teachers are asked to put them into the hands of promising students as matter for research. That is the sort of work which the Society of Public Analysts could very well pass on to the Chemical Department of the National Physical Laboratory. It is precisely the sort of work which they ought to do. No doubt if research on the improvement of methods can be done in Chemistry it can also be done in Physics or Engineering.

347. If a Committee were formed it would be able to arrange matters with the National Physical Laboratory as to the fees charged for particular classes of work ?—Certainly.

348. So that it might avoid at all events charging fees lower than, or equal even to, those which are charged by private individuals ?—Yes, that is true. It would bring such people indeed into touch with the National Physical Laboratory.

349. (*Sir John Wolfe-Barry.*) This board would be a board for suggestions ?—It would be a board for suggestions.

350. (*Sir Andrew Noble.*) But are not you assuming that the time of the National Physical Laboratory would be taken up by a number of people constantly sending tests. Now according to the view of the original committee, and according to the view I am expressing now, it would only be an exceptional thing, and as a reference, that this analysis would be proposed, and that it seems to me, as our Chairman said, might be sufficiently guarded. I do not care whether you put the price 50 per cent. higher as compared with what the Chemical Institute would charge, but what I desire, I being on the side of the manufacturers and the public altogether, and not on the side of the Government, is a power of testing that the Government must respect. They will respect the analysis of no private individual. That is their course, because I know it from long experience. They would respect an independent analysis from their own Laboratory, but, as I say, I do not care what price is fixed above the ordinary prices, and I should certainly reprehend in the strongest way what you speak of, that is it being possible to charge prices under the trade price.—Yes, but that again refers only to disputes between private individuals and the Government, does it not ? Would you have the National Physical Laboratory made the arbiter in cases of private disputes ?

351. The disputes I refer to are always with the Government. Then there is one other point. I myself think it would be a very exceptional thing, but I would agree to a considerably higher price than the price fixed by the Institute of Chemistry for their own trade prices ?—Yes ?

352. (*Mr. Chalmers.*) For reference cases, that is ?—Yes.

353. As touching the higher fees in reference cases, especially if limited, as I think I understand you to suggest, to an individual dealing with a Government Department, reference cases stand very much apart from commercial testing in general, do not they ?—I suppose so, but, actually, I cannot tell you. For example, some of my friends, I daresay, have a great many reference cases.

354. I do not mean different as regards the individual, but there are different cases ?—There are different cases.

355. There are arbitration cases, and arbitrators find what is to be paid by people, such as contractors dealing with the Government ?—Quite so.

356. Therefore the reference cases are very peculiar and distinct in class ?—Yes.

357. Now take another class of case. Take the Government buying steel and iron for armour plates. The Admiralty buy a great many armour plates and they have samples tested. They do not go to the outside trade, as I think you know, but they go to a chemist in Portsmouth, and you would have no objection to that ?—Not the slightest.

358. You would have no objection to the Admiralty if they saw fit, saying good-bye to their own analyst at Portsmouth and putting the work in the hands of the National Physical Laboratory if they thought fit ?—Not the slightest.

359. And what applies to the Admiralty applies to the India Office ?—Quite so.

360. You have got, therefore, a second branch of work to which you would have no objection, speaking for commercial men, but as regards commercial testing by the Government or by the National Physical Laboratory, it is then for the Government, and you have got that in addition to reference cases in reference to contractors dealing with the Government ?—That is so.

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361. Now take the other case. I was not quite sure as to your meaning. I come now to things outside that altogether, and I come to commercial testing where there is no Government interested in it. It is not a contractor dealing with the Government but simply a man in the street, say, Jones, who makes a certain soap and sends it up to be tested. Would you, speaking on behalf of the professional chemists, be satisfied if in the testing of the soap a certificate of the Government Physical Laboratory could be obtained at 50 per cent. over that of an eminent chemist ?—No, I think it would be placing the Government in an entirely wrong position.

362. But what about the position of the eminent analyst to whom the soap maker might have gone in the alternative ? If the thing is wanted for the purpose of advertisement, does the height of the fee give the outside analyst any chance at all ? Is it not the Government certificate that is wanted ?—No, you make a mistake. No analyst would on any consideration give a certificate at all. If he does that he is at once censured by the Institute of Chemistry. That is absolutely forbidden—that is to say the issue of a certificate which can be published as an advertisement.

363. Has such a case arisen in your knowledge in connection with the National Physical Laboratory of a certificate being published ?—Not in connection with advertisements of that sort as far as I know, but I do not know enough about it. But if one of the Fellows of the Institute of Chemistry does an analysis for publication, cracking up, say, Jones' soap or cod liver oil, he is censured, and if he persists in it his name may be removed from the register.

364. Then what about the magnitude of the fee ? Does that apply, because the private person is excluded from such a possibility ?—Yes. The Government already possesses a Department whose business it is to do what you have been speaking of as regards chemistry.

365. (*Sir Andrew Noble.*) But it is that very Department that contractors sometimes have a dispute with ?—Yes, and you want another Department which you can appeal to, perhaps.

366. (*Mr. Chalmers.*) You have no particular objection to what goes on so far as its existing scope is concerned ? It is a very small business ?—Yes, very small indeed.

367. It is the principle you object to ?—Yes.

368. You object to commercial testing which comes into competition with private persons ?—Yes, that is so.

369. When you went on the 16th February, 1897, with Sir John Wolfe-Barry and Sir Andrew Noble to Lord Salisbury to press for a National Physical Laboratory, had you in view any commercial testing ?—None.

370. Did you not as a matter of fact confine your recommendations entirely to the purely scientific aspects of the thing ?—Yes, we did, I think.

371. Consequently, as a merely historical fact, you would say that you went on a purely scientific basis ?—Yes.

372. And that is the reason for the existence of the National Physical Laboratory, and any movement it may make towards commercial testing represents a development on lines not originally contemplated at the inception of the Institution ?—That is my view.

373. (*Sir John Wolfe-Barry.*) I have only one question to put. You say that you think that it is for the public advantage as to settling disputes between the Government and their contractors ?—Yes, it may be taken to be an advantage.

374. Now take the case of a great railway company, or a great shipping company, or any large mercantile undertaking. They also have disputes with various contractors ?—That is true.

375. Can you differentiate between the public advantage of settling a dispute between these parties and the settling of a dispute with a Government Department ?—Yes, I think so. This Institute gets a certain support from the Government, and naturally the Government will ask for a *quid pro quo*.

376. But do not you know that the National Physical Laboratory is largely supported by the railway companies and by large mercantile firms, and they look for a *quid pro quo* too ? The Government do not support the National Physical Laboratory except in part ?—I think it would be very risky for the National Physical Laboratory to undertake that sort of work, because mistakes will be made. If an analyst makes a mistake there is no possibility of an action against him, but at the same time his reputation will go down, and it puts the National Physical Laboratory on the same footing as a practising analyst. But at the same time it has got the protection of the Government ægis, and it is putting it in a false position, I think. May I add one more word as regards consultative Boards ? I should like you to consider the suggestion closely. I have recently been through Guinness's Brewery in Dublin. They have a very large staff of about 20 or 30 scientific men, and they have formed such consultative Boards. That is to say, problems are sent in for solution by various heads of departments, or by members of the Laboratory, and they attempt the solution of them. The problems are taken in order and discussed.

377. (*Sir Andrew Noble.*) I do not say that the Government ought to say it, but there is no question but that what the Government Department says is received with far greater weight than anything that is said by a private firm or analyst.—That is true.

378. I do not say that they ought to have that weight, but they have it ?—They have it.

379. And that is what we have to recognise ?—Yes.

380. (*Mr. Chalmers.*) That is part of the gravamen of your case, is it not ?—It is.

THIRD DAY.

Thursday, 18th April, 1907.

PRESENT:

The Right Hon. GERALD W. BALFOUR (*Chairman*).

Sir ANDREW NOBLE, Bart., K.C.B.
Sir JOHN WOLFE-BARRY, K.C.B.
Mr. W. J. CROSSLEY, M.P.
Mr. ROBERT CHALMERS, C.B.
Mr. G. C. UPCOTT (*Secretary*).

Dr. PERCY F. FRANKLAND, F.R.S., called and examined.

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381. (*Chairman.*) You are, I understand, President of the Institute of Chemistry of Great Britain and Ireland ?—Yes.

382. And Professor of Chemistry in the University of Birmingham ?—Yes.

383. You are also Chairman of the Birmingham and Midland section of the Society of Chemical Industry ?—Yes.

384. A letter was written by you on behalf of the Institute of Chemistry last year which has been communicated to us by the Treasury, complaining of the character of some of the testing work carried on in the National Physical Laboratory; but of course we feel it would be a great advantage to us to hear your views in greater detail.—The attention of the Council of the Institute of Chemistry has been repeatedly called to the fact that the testing carried on in the

Laboratory goes beyond the limitations indicated in the Treasury Committee's Report (1898) Section 9, from which it appears it would "be proper for investigation at a public institution as distinguished from the ordinary testing of materials used in commerce or in construction and machinery which can be and is now efficiently conducted at private establishments." Without referring to the specific cases of such testing which have been brought to my knowledge, I would point out that the "Test Pamphlet" (July, 1906) issued by the Laboratory is framed in terms which entirely contravene the above recommendations of the Treasury Report. I will only take two specific instances in illustration. On page 9 of this pamphlet it speaks of the determination of calorific value of coal. The determination of the calorific value of coal, of course, is carried on by a great number of practitioners. It is quite a common routine test, and it could not possibly be contended that it is not now efficiently conducted at the private establishments. Then the second example which I would take is on page 7, the testing of materials of construction. This work, as is well known, is at present carried out as a matter of commercial routine by experts in private practice who have spent large sums of money in equipping their laboratories with their apparatus necessary for this purpose. A great deal of evidence was given before the Treasury by a number of distinguished witnesses who enlisted public interest in the foundation of a National Physical Laboratory by stating that the work conducted there would not be for the benefit of private persons engaged in trade, but for the good of the country as a whole. The work was to be of general interest and the results obtained were to be published. The "Test Pamphlet" on the other hand, appears to have for its object the attraction of the private client, in fact the building up of a consultative practice, and the investigations referred to in it are of specific and private, not general or national, importance.

385. No doubt you are aware of the nature of the reply which the Laboratory authorities made to the representations which were laid before the Treasury; they point to other passages in the Report of the Committee. For instance, they refer to the general conclusions on page 6 "that a public institution should be founded for standardising and verifying instruments, for testing materials, and for the determination of physical constants." They also point out that the Physikalisch-technische Reichsanstalt of Berlin does this kind of work, and to the recommendation that the proposed Institution should be established on the general lines of the German Institute. What suggestions would you make to the Committee in answer to that reply?—I think the whole of the recommendations are qualified by this Clause of Section 9, that "it would be neither necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories; but there are many special and important tests and investigations into the strength and behaviour of materials which might be conducted with great advantage at a laboratory such as is contemplated in the reference"—I think the whole of those recommendations are governed by that Clause, which implies that it is not routine testing of materials to see whether these materials comply with a specification or anything of that kind, but it is the examination and investigation of materials as a whole, particular kinds of materials, steel for instance, or brass, or anything of that kind; not whether a particular sample of brass is up to the specification which is demanded, not the routine tests as we commonly call them. I do not think that is contemplated in the very least.

386. What do you make of the first sentences in Section 9? I will read them out. "There is much evidence that further facilities are needed by the public for the standardising and verifying of instruments, both for scientific and commercial use; and also that it would be of great benefit to trade if means were provided for the public testing of the quality of certain classes of materials. In particular, the Committee desire to draw attention to the evidence which has been laid before them as to the difficulties arising in certain Government departments in their dealings with contractors and others which might be overcome by the establishment of an independent testing authority." Does not that point to what may be called reference testing as a thing desirable to be carried out by the National Physical Laboratory, which would only be distinguished from ordinary routine testing by this, that it was in order to decide some disputed point that the Government Department might be asked to undertake such work?—No doubt it refers to the Government Department.

387. When I say "Government Department," I should have said the National Physical Laboratory?—Yes, but in connection with the Government.

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388. But even apart from that does it not say "that it would be of great benefit to trade if means were provided for the public testing of the quality of certain classes of materials"?—Yes, but as I said before, that is all qualified by this next sentence: "It would neither be necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out." Anything which is at present being efficiently carried out by private persons, I take it, they do not contemplate would be duplicated by the Laboratory. That is the view which the Institute of Chemistry takes.

389. It may certainly be contended that the sentence you have read must be taken to be a governing sentence as regards Clause 9, and as regards the work recommended by the Committee as proper for the National Physical Laboratory to undertake, but there are other sentences in Clause 9 that seem to point to a notion on the part of the Committee that some kind of testing of materials should be undertaken by the National Physical Laboratory. I want to know what your view is of those sentences?—I can only conceive they are recommending the establishment of such particular kinds of tests as are not being efficiently carried out at the present time by other people.

390. Then you think it would be in accordance with the Report if the National Physical Laboratory were to confine itself to tests which are not at the present time being carried out by private enterprise, although in the course of the possible development of private enterprise they might eventually be so carried out?—I think that would be in accordance with this paragraph. I do not say it is desirable in my opinion, but I think it would be in accordance with this.

391. The meaning of the paragraph would, you think, be met if the National Physical Laboratory was to regard itself as limited to that kind of testing work?—Anything which was not being actually done at the time and to afford facilities for such testing as cannot be done elsewhere, and efficiently done.

392. At the same time that limitation would apparently not apply, if I understand your view rightly, to the work of Government Departments. Reference tests in which the Government Departments were interested might be undertaken by the Laboratory consistently with the terms of Section 9?—I have dealt with that matter of Government Departments in another paragraph, but I think as far as this paragraph goes it undoubtedly suggests that Government Departments might use the National Physical Laboratory, although, of course, it is questionable whether this clause does not also govern that. If the Government is at present employing private specialists, the Laboratory will undoubtedly compete with them if the Government takes that work away.

393. Do you come here as the representative especially of the chemical industries?—I appear to represent the Council of the Institute of Chemistry, but we have not confined our criticisms of the National Physical Laboratory to the chemical point of view at all. We have taken it up from the point of view of professional men as a whole, and with reference to both chemical, physical and mechanical tests, which are made by professional men.

394. The actual examples given in your *précis*, I think, do not refer to chemical testing?—The testing for the calorific value of coal is, I suppose, mainly done by chemists, and, of course, it is a mixed chemical and physical question; but it is mainly done by chemists, I imagine, as a matter of fact. As for the testing of materials, that is also partially chemical and partially mechanical. It is usual, I believe, for a chemist and an engineer to work in conjunction in these matters. There are so-called testers who make the tests with the testing machines, and the results obtained in that way are compared with the results obtained by chemical analysis, and the report is sent in, sometimes signed jointly by these two experts, sometimes signed by one or the other.

395. As regards the chemical tests, were not the terms of the Test Pamphlet of 1906 altered at the request of the Society of Chemical Industry?—That is so, and in the last number, in July, 1906, the reference to chemical tests no longer appears. But it does not at all exclude the possibility of making chemical tests, because if there is any other investigation asked for in connection with a substance, the chemical examination may be made at the National Physical Laboratory. For instance, an oil may be examined for viscosity, or something which would be regarded as a physical test, and in connection with that the chemical analysis of oil might also be carried out. So that

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such tests would still interfere with the practice of chemical experts if undertaken in that way.

396. Apart from that point, are you satisfied now with the terms of the Pamphlet of 1906 as altered from previous editions?—It is an improvement, but we disapprove entirely of the notion of these tests at the National Physical Laboratory at all, if they are interfering with the practice of professional men who are doing the same work efficiently and have done this work for a long period of time.

397. So that the alteration, although it goes in the direction which you desire, does not entirely satisfy you?—Certainly.

398. Is that the view of the Institute of Chemistry?—Yes, that is the view of the Council. You see there are a great many tests referred to in this Pamphlet, although they are not chemical tests, but they are tests which are carried on by professional men and have been such, for instance, as the testing of incandescent mantles, the testing of the resistance of wire, and the insulation of wires. A great number of electrical tests and other tests of the kind which are made by professional men are now being made by the National Physical Laboratory, and in fact they are advertising for such practice in this Pamphlet which they issue and distribute.

399. Have any complaints been received by you from private engineering laboratories?—They have not reached me personally. I do not know of any cases of that kind. But complaints have reached me from chemists who work in conjunction with engineers in such tests.

400. The Institute of Chemistry has not associated itself with other bodies in making these representations to the Treasury?—We associated ourselves with the Society of Chemical Industry and the Society of Public Analysts. We addressed a letter to them, and I think it was in consequence either entirely of that letter, or partly at any rate, that the Society of Chemical Industry approached the National Physical Laboratory and got that matter altered.

401. You have had no communication with engineering associations on the subject?—No; not that I am aware of.

402. I see you lay great stress upon the importance of publishing all the results obtained at the National Physical Laboratory?—Yes. I think that is very desirable. I am sure it was contemplated.

403. Was it contemplated in connection with the standardising of instruments that all results should be published?—No; I do not see that they would serve any great purpose—simply a record of the number of instruments tested.

404. But the standardisation of instruments is one of the objects for which the National Physical Laboratory was established?—Yes; what we call the Kew work.

405. That would apparently constitute an exception to the general rule that results should be published?—That is so with regard to Kew. That any details of that work should be published seems to me quite unnecessary, but reference would be made to it in the Report which, as I understand, is to be annually published, and to which reference is made in Section 24. "A report of the work of the Laboratory should be annually furnished to the Government by the Royal Society, together with properly audited accounts." I think, inasmuch as it is a national institution supported by public funds, the Report should be accessible to the public. I may mention that many of the Witnesses who gave evidence before the Treasury Committee spoke about this publication as a matter of course, and that all the work undertaken by the Laboratory should be reported even if it was undertaken for private firms.

406. But that clearly did not refer to standardising work?—No, not to the mere routine standardising work.

407. And on the same principle, if there was to be any routine testing of materials, it would not apply to that either? There would be no utility in publishing the results of the tests?—I can conceive that even that might have some value. You would have statistics as to the composition of steels and brasses, and so on, which might be useful for reference.

408. But if you found an argument upon the desirability of publishing all results, if you found upon that an argument that unless the results are published the investigations ought not to be undertaken, that would apply to standardising, as well as to tests of materials?—Yes, but not from that point of view.

409. I asked the question with a view of eliciting whether you thought a solid argument could be founded upon this question of publication. You have used that argument to show that the testing of materials is properly outside the functions of the National Physical Laboratory?—Yes, that is my opinion.

410. If the argument was sound, it would go to show that the standardising of instruments was also outside the functions of the National Physical Laboratory?—No, with all respect, because I think they provide distinctly for the standardising of instruments. That is a great want which is felt in the country, and it can only be done at an institution like this, just as it was done at Kew. This seems to be a sort of extension of the Kew work. But with regard to other work, I take it the Laboratory should only undertake such investigations the results of which would be of public utility, and which ought therefore to be published. I think, perhaps, that forms the best criterion of what sort of work should be undertaken other than this standardising of instruments, viz., that results of the work would be likely to be of practical importance to the country, and of general interest.

411. If you are obliged to make an exception of the standardising of instruments, it might be equally necessary to make an exception of the testing of materials?—Except that the standardising of instruments is so distinctly referred to by the Committee, and that it is well known that that particular kind of work must be done here, because it has been done at Kew before, and as I understand it, the Kew work has simply been transferred to the Laboratory.

412. But in saying that do not you fall back upon the general argument that it is undesirable for the Laboratory to undertake the testing of materials, but that it is not undesirable for it to undertake the work of standardising. You cannot make a special argument out of this question of publication. Whatever argument you apply to the testing of materials derived from the desirability of publication of results, would apply also to standardisation work, and yet it is admitted that standardisation work is proper work for the National Physical Laboratory to undertake?—Perhaps I might put it in this way, that it was really the main object of these gentlemen who appeared before that Treasury Committee, and their idea of founding such a National Physical Laboratory was for the purpose of research and general investigation, and those purposes are interfered with by this routine work, and they are even interfered with up to a certain point by this standardisation. I have no doubt the National Physical Laboratory would have more time for research and original investigation if they had not to do even with standardisation of instruments. But that, I take it, they are obliged to do, because there is no other place where it can be done. But any other work which they undertake I think ought to be of such a nature that the results would be suitable and valuable for publication. That is the argument which I wish to put before you.

413. That brings us to another point. You go on in your *précis* to say that you wish especially to emphasise that "the cultivation of a clientèle of persons desiring to have routine commercial tests made at the Laboratory as is the obvious intention of the Test Pamphlet advertisement, is calculated to interfere with the research work for which the Laboratory was primarily founded." In what way do you think that the undertaking of testing of materials would interfere with the research work for which the Laboratory was founded?—Because this test work takes time. It is very responsible work and requires very careful looking after, and if a man's time is taken up with that, it must be taken off the time to be devoted to research and investigation.

414. Could not that be obviated by increasing the staff of the Laboratory?—Undoubtedly, if you had two separate organisations, one for testing and one for research, that could be carried out, but it would have to be an enormous organisation to overtake both of these on a large scale.

415. On a large scale, certainly, but even so I do not quite see how the research work of the Laboratory would be interfered with?—If the same men are engaged both on research and on this routine testing, I think it is obvious that they cannot be spending so much time and giving so much attention to research as they would if they were not doing the testing work.

416. No; if you are bound to use the same men, and the number of men is limited, no doubt the time occupied in one thing could not be devoted to another. But that would not prevent the extension of the staff of the Laboratory sufficiently to cope both with the research work and the other work if necessary?—Of course it could be extended.

417. I asked you that question because the Laboratory authorities contend that, on the contrary, their being allowed to undertake routine work tests would increase the efficiency of their work. What would you say to that?—I do not understand in what way it would. Those who are engaged in routine tests always complain that they have no time for research, and it undoubtedly is the case that if there is a great deal of routine work going on, which has to be got out in a particular time, and which is urgent, there is no opportunity for carrying on the special work of investigations. Everybody who has done routine work of this kind must have felt how much it does interfere with the research work going on at the same time.

418. Must not a good deal of the work carried on by the Laboratory involve the co-operation of more than one member of the staff?—Yes, that is so, no doubt. I have said if the staff is adequately increased, no doubt it could overtake both the business of routine testing and research work. But it would have to be very greatly increased.

419. Very greatly increased if the Laboratory is to undertake a large amount of routine work?—Yes; and increased in this particular way, that you would have to have first-rate men in both of these departments. You see the country expects that this Laboratory shall do research work of the highest order, and any people who consult this Laboratory for routine work will also expect that that routine work is of the same degree of reliability as is carried out by the very best experts outside. It will be necessary, therefore, to have very highly-paid and very thoroughly-trained men, both on the research side and on the routine side.

420. I think you have some remarks on that subject further on?—Yes.

421. Perhaps we had better now proceed to the second head in your abstract of evidence, the possibility of the work of the Laboratory interfering with private agencies?—The performance of much of the work referred to in the Test Pamphlet cannot fail to interfere with, and be detrimental to, the professional men who are carrying on the same tests for both public bodies, and private clients. These practitioners have now to meet the competition of a state-aided, non-rate paying concern, which advertises for work in a manner which would universally be regarded as derogatory to the dignity of a professional man, and which charges low fees, and issues certificates bearing the seal and imprimatur of a national institution.

422. You say that the manner in which the National Physical Laboratory advertises would be universally regarded as derogatory to the dignity of a professional man?—Yes; I do say so.

423. Would you explain that to us a little further?—No professional man would ever think of sending out a document of this kind. Amongst all professional men, every form of advertisement is regarded as in the highest degree derogatory.

424. Is it contrary to professional etiquette to issue a list of charges to the general public?—Yes, entirely contrary to professional etiquette.

425. (*Mr. Chalmers.*) You would send them to clients, would you not?—On application you would say what the charges would be, but that would be for the particular things which were asked for. Of course, if you were asked what your fee for a particular investigation would be, you would not at the same time say what your charges would be for all sorts of other things.

426. (*Chairman.*) In the chemical industry, I understand it is really contrary to professional etiquette to issue to the general public any statement of the fees for which you are prepared to undertake the work of chemical analysis?—Undoubtedly. It may be done by some practitioners, but it is contrary to professional etiquette.

427. (*Sir Andrew Noble.*) We always know what they are going to charge. They always inform us?—You ask them by letter, I suppose, what is their charge for the analysis of a sample of steel.

428. (*Chairman.*) I understand your point is that it would be unprofessional to issue a general statement to the public?—Yes.

429. It would be not unprofessional to inform clients?—It would be unprofessional to inform clients unasked by them. Unless you were asked by them what you were going to charge for such and such specific things, it would be most unprofessional to send a scale of charges even to clients.

430. You also speak of the low fees charged by the National Physical Laboratory. From the evidence which has been placed before the Committee by Dr. Glazebrook, I am quite sure it is not the intention of the National Physical Laboratory to charge lower than the ordinary professional fees?—I quite accept that. As a matter of fact I have a few cases which have been brought to my notice. This is entirely outside my province in chemistry, but I have got a few statements about these fees which have been put into my hands. I understand with regard to page 7 of this Pamphlet, "the testing of materials of construction, in the 1903 Pamphlet the fee for a single sample was 5s. This was raised in 1906 to 10s. 6d., the more usual fee—though some charge 12s. 6d., and others as much as £1 1s." So that you see the charge was only one-half of that which at any rate the heads of the profession charged. "Page 9: Determination of calorific value of coal. Fee, 15s. for a single sample. The usual professional fee for this would be £1 1s." That is the only one of these determinations which possibly I have any knowledge of, and I should say that £1 1s even was a comparatively low professional charge. Then "in the Physics Pamphlet, 1906, page 22: Determination of percentage of ash in arc lamp carbons, per carbon, 10s. 6d. The usual fee is £1 1s. (2) Page 49: Determination of Melting Points, &c. Where the melting point is not above 1,000 deg. C., the fee for its determination, 10s. 6d. The usual fee is £1 1s. For cooling curves from 900 deg. C. downwards, the fee is £1 1s. From 1,100 deg. C. downwards the fee is £1 11s. 6d. The usual professional fee for the above is 3 guineas and upwards. (3) The main criticism in this matter is with regard to the fees charged in connection with the work for the Indian railways, which was formerly done at Cooper's Hill. The National Physical Laboratory authorities propose to charge 2 guineas for steel rails, or about half the fees formerly, and usually charged. This is most serious and damaging to professional men engaged in this kind of work, as these fees are recovered from contractors and, consequently, manufacturers in different parts of the country will see that work is being done at this low rate and it will be difficult for practitioners to maintain their present charges."

431. I notice that those cases are drawn either from the engineering pamphlet or from the physics pamphlet. None of them refer specificially to chemical tests, do they?—The test for calorific value is a chemical test, I think. The determination of the percentage of ash in the lamp carbons is a chemical test, and the melting point test is also done by chemists or metallurgists, who are practically chemists.

432. Are the notes as to fees charged by the National Physical Laboratory, which you have just read out, prepared by the Institute of Chemistry?—That is so.

433. Do you happen to know whether these are the only cases or merely selected as instances?—No, I think these are only instances so far as I know. What I read last, under 3, of course refers entirely to chemists, because that is the charge for this Cooper's Hill work.

434. That, perhaps, stands on rather a different footing, because the Cooper's Hill work has always been done by a public institution, has it not?—Yes, but the charge they are now making is lower than what was made before, and this will have the effect of lowering the fees for the same kind of work all over the country, because they will be taken as the standard fee. Probably if the National Physical Laboratory charges only 2 guineas for a steel rail it will be impossible for a private practitioner to get more, although he has been getting more.

435. Is that a mechanical test?—No, that is a chemical test.

435A. I presume it is the development of this work in the future that you fear rather than anything which has actually been done so far. The actual number of tests of material which have been carried out at the National Physical Laboratory have been very small so far?—Yes, we have received information from the National Physical Laboratory that so far very little work of this kind has been done as far as this other testing work is concerned.

436. But has much other testing work been carried out, according to your information?—We have not had any information about that. Perhaps I might put in the correspondence which has passed between the Institute of Chemistry and the National Physical Laboratory.

437. Yes, we should be very glad to have it?—If you please.

438. As a matter of fact, the testing of materials has so far been carried out on a very small scale at the National Physical Laboratory?—A very small scale.

439. Then you are of opinion that not only is this

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competition highly injurious to the interests of the professional men concerned, but also to the interests of the public at large?—Yes, I am, because, of course, there is only a certain amount of this work in existence, and if it is taken away from the professional man, the professional man will cease; the supply will cease. It is very important that there should be a body of highly-skilled and carefully-selected professional men in the country, and if there is no work for them to perform they will cease to exist.

440. That is looking a long way ahead, is it not, to suppose that the entire work of this kind should be absorbed by the National Physical Laboratory, even if the Laboratory were permitted to continue on the present lines?—There is no knowing how rapidly it might extend.

441. You refer to the advantage of ceaseless activity in practice?—That is the way a professional man is trained.

442. Does not that to some extent support the contention of the Laboratory authorities that some practice of this kind is desirable?—Undoubtedly, if they are to have men who can carry out this work they must be trained; but it does seem rather anomalous that their training should be at the expense of the public in this national institution, when there are numbers of men who are already trained in the profession outside.

443. But some of the investigations which you yourself would regard as legitimate involve this testing work, do they not?—No doubt.

444. So that if the Laboratory Staff had no practice in carrying out that testing work they would be placed at a disadvantage?—Yes, but I think one can conceive that a far more beneficial way for the National Physical Laboratory to carry on such work would be that they should co-operate with professional men. I have referred to that at the end of the *précis* which I have sent in. There are so many points on which the ordinary professional man is entirely ahead of any man they are likely to have in the National Physical Laboratory for a very long time to come in particular things; so that they might very advantageously co-operate with professional men, the professional man supplying his part of the information, and the National Physical Laboratory supplementing that by the particular work for which they have special appliances.

445. The particular work at present undertaken by the National Physical Laboratory to which you object is the routine work, and not the higher work?—Yes, the routine work.

446. So that you suggest that these eminent professional men should be taken in, not to do the higher work of the National Physical Laboratory, but that any routine work incidental to the higher work should be done in co-operation with outside professional men. Would not that be a very awkward thing; if you require certain chemical tests in an investigation you are undertaking, would not it be very awkward to have to refer those tests to the professional men outside? So far as their character was concerned, they might be tests of an ordinary routine character; but if there was nobody at the National Physical Laboratory competent to carry them on, would not that give rise to great inconvenience?—There might be people who could carry that on, but they would not be allowed to carry on a practice such as would naturally grow out of an advertisement like this Pamphlet.

447. I quite understand the very serious objections that you entertain to anything like an extensive practice; but might not the difficulty to a certain extent be met by raising the fees of the National Physical Laboratory to a point in every case at least equal to, and perhaps greater than, those charged by professional men in private practice?—I think that that would mitigate the injury, but I do not think it would altogether abolish it by any means. It would undoubtedly be better than what is being done at the present time.

448. I think we have already dealt with the desirability of publishing the results of all testing work in connection with the questions I have already addressed to you. Is there any statement under that heading with which you wish to deal more in detail?—Not in the matter of publication.

449. Then we come to the fourth point: "Whether, having regard to the industrial interests of the country generally and to those of private agencies, any change is desirable in the scope of the work of the Laboratory and on what lines any further development of its business should proceed"?—I am of opinion that the industrial interests of the country generally will not be advanced through duplicating the means of carrying on work which is already efficiently performed, but by providing the means for the performance of work which is at present either not carried on at all or only carried on under difficulties. It is in the direction of research and original investigation of every kind that the scope of the work of the Laboratory should be extended. As was so fully stated by the Witnesses before the Treasury Committee, there are innumerable problems connected directly and indirectly with the arts and industries of the country which require investigation, and which for various reasons are not attacked by individual investigators. Such problems are constantly coming to the knowledge of professional men who have neither the leisure nor the means for undertaking these investigations, and I can conceive of the most valuable results to the community being achieved by the friendly co-operation between professional men and the National Physical Laboratory.

450. I suppose that any institution undertaking an investigation would like as far as possible to carry out that investigation in all its details themselves. I mean it would be a great convenience to them to be able to do so; would it not?—Speaking broadly, yes, I think it would probably, but it is quite a common thing for investigators to work together, and that one man does that part of the work which he is most fitted to do, and his coadjutor does the other part. It is a very common mode of scientific investigation for persons to work jointly.

451. But it would probably be in the interests of the efficiency of the work of the Laboratory if the staff were able to carry on the work among themselves without having to call in assistance from outside?—I think they ought to have members of the staff capable of carrying on the different branches of the investigation.

452. Members of the staff of the Laboratory ought to be able to carry out the work of testing materials?—Oh, certainly.

453. Sir William Ramsay suggested to us the expediency of establishing Advisory Committees of professional men in connection with the work of the Laboratory. Do you concur in that suggestion?—Yes, I think that might be very valuable.

454. Such Advisory Committees might both suggest problems, and also perhaps enable the National Physical Laboratory to avoid unnecessary competition with private enterprise?—Yes. I think that such Advisory Committees would be very serviceable indeed in connection with the Laboratory.

455. (*Sir Andrew Noble.*) In your first page you speak of the testing of materials of construction. Of course one knows there are a very considerable number of chemists who carry on chemical work for the public, but as regards the testing of materials of construction, how many private laboratories do you think there are in the country?—Do you mean for testing the strength of material?

456. The strength of material, and so on?—I believe I know of perhaps half a dozen.

457. I do not know of half a dozen, but there may be. I do not suppose it would interfere much with that, but I need not say that all large works are provided with their own testing machines, and, in fact, some of them have made testing machines for Government use. But one difficulty that many firms have to contend with is this. If there is a difference between a contractor and one of the head men of the dockyards, it is no use whatever going to a private testing place; but if we have a great Laboratory established by the Government itself it is exceedingly useful either for chemical questions or for material questions to have a public establishment to which the Government cannot take any exception. Now, the course that our Chairman referred to just now would meet the case exactly if it be provided that the charge paid, is above the trade rules of charges. You know there are many cases of this, and as regards the strength of material, of course we do not require to go to anybody except to the National Physical Laboratory. In the case of chemistry we do all our own analyses; I am speaking of my own company. On two or three occasions I have referred to the National Physical Laboratory, but never without going to a private one at the same time. Lately the National Physical Laboratory have refused to take these analyses. The question I put to you is: Do you see any objection to that course?—The work which would be submitted in this way, I take it, to the National Physical Laboratory is of a varied character. Take, for instance, materials and stores connected with Indian railways or anything of that kind. I understand you would wish to see the National Physical Laboratory the Court of Arbitration for all these different materials, and I think it is practically impossible that one institution should be capable of acting in this capacity over such a wide range of subjects.

You would have to have men representing each of these branches of the same reputation as the leaders of the specialists outside, otherwise this Court of Arbitration would not command any confidence. If it was found that the analyses carried out by this National Physical Laboratory were not equal to those which were done elsewhere, it would lose its prestige. It might act as the arbitrator over a narrow range of subjects, but I cannot imagine its acting as the arbitrator *ex officio* on all things which could come up in dispute in that way. It seems to me for that purpose a much more desirable course would be that there should be a committee of reference chosen from the highest specialists in the country, and that this should be a standing committee to which all questions of arbitration should be submitted. But I cannot imagine that such a reference business could be carried on successfully by a single institution. They might act in that capacity for certain things, but not over such a very wide range of subjects as has been suggested.

458. I am afraid you would not find the Government agree to a Committee of Reference, but, however, that is beside the question. You say that not only is this competition highly injurious to the interests of the professional men concerned, but it is also, in your opinion, injurious to the interests of the public at large. You are acquainted, of course, with the Reichsanstalt in Germany. Are you aware that it is considered by manufacturers in Germany that the Reichsanstalt is of great service ?—Yes, certainly, but I do not know whether the routine work which is referred to there which is done by the Reichsanstalt is regarded as of such particular value. It is the Reichsanstalt as a whole which I take it is valued so highly.

459. So far as I know it was the intention of the Committee who recommended the arrangement that it was to be very much on the same lines as the Reichsanstalt. I have caused enquiry to be made in Germany through private sources, and I am assured that it is looked upon with favour. Have you heard the contrary ?—No, I have not heard the contrary.

460. Do you consider that the course that would be followed by the National Physical Laboratory is much the same, with, perhaps, better instruments, as would be followed by a private practitioner, that is to say, with an eminent man or two at the head, a d subordinates to carry out the routine part. Do you object to that principle ?—In order that it should be efficient, you would have to have a great number of these men, because there are many different branches in which this work has to take place.

461. Take for example any of the great analytical chemists in the North of England ?—Mr. Stead, for instance.

462. Yes. There are not more than two men at the head of that firm ?—But then his work does not extend over the wide range indicated in the Pamphlet. He does not undertake electrical tests, and all that kind of thing.

463. I am only asking now as to these tests which private firms, for example, would send there ?—Do you mean taking the case of strength of materials ?

464. No. They undertake chemical analyses. I do not understand they undertake tests of the strength of materials. They chiefly have chemical tests of iron and steel, &c. In that case you cannot say there are more than two men at the head and a number of subordinates ?—Yes, but then how would this distinguished man get into the National Physical Laboratory ? Would he have to be trained there, or would he be put in when he was at the height of his reputation ?

465. That is for the head of the National Physical Laboratory to determine ; it is not for me to determine that point. What I want to know is this. I observe that you say here that even if the National Physical Laboratory were initially equipped with an ideal staff, the latter could only hold office for a few years without falling behind the outside leaders. That I altogether doubt. I will just take the last few Presidents of the Royal Society. Do you consider that Lord Kelvin, Lord Rayleigh, Sir William Huggins, and others, have only held their position for a few years ?—I think that a man in this capacity would be expected to exhibit great activity, and he would not be the best man at that sort of work for a very long time together. With a professional man it is found that a man has a very short vogue, so to speak.

466. Do you tell me then that the men who are at the head of these chemical laboratories and mechanical laboratories retain that position for only a very few years ?—I do not think they hold it for very long before younger men come in and gain a vogue of their own. It is very frequently the case.

467. I think some of them hold their positions for a very long time ?—Professors hold their positions a very long time, but that is not always a very good thing.

(*Sir Andrew Noble.*) I quite agree with you as to the objects of the National Physical Laboratory, but at the present time I cannot quite understand your objection to their making certain researches and charging for them prices which would not be lower than the ordinary prices of the trade.

468. (*Mr. Crossley.*) Have you seen this great list of men employed in the National Physical Laboratory ? There seems to be a very considerable list. I want to ask you if you do not consider those sufficient for a very considerable investigation ?—The ground covered, of course, is very extended in the programme. I am not prepared to say whether they are sufficient or not.

469. You seemed to think it was so impossible to get a sufficient staff to cover a considerable amount of ground ? —Yes, with a sufficiently eminent man at the head of each department.

470. Have you noticed the enormous number of papers which they have published, apparently on independent research ?—No.

471. We have here page 21 to 26, giving lists of papers read by the various members of the Institution. It seems to me they manage to do a great deal of work besides the amount of routine work, which is also given. You have not seen this ?—No. I imagine the investigations are entirely outside my province and I am not acquainted with them.

472. (*Mr. Chalmers.*) There are no chemical investigations that they have carried on for instance that have forced themselves on your attention as a chemist ?—No.

473. (*Mr. Crossley.*) Did you notice that the total number of tests in the way of strength of materials was 80 in 1904, 144 in 1905, and in 1906 was only 21 ?—No. I have not seen the statistics.

474. I want to know what this cry is about and who are engineering this. I have not been able to get at it. There were only 21 physical tests made in 1906 on the strength of materials. Who are injured ?—I do not think that is the fault of the National Physical Laboratory.

475. I do not know. They have had three years working and they do not seem to have done much harm, and I defy them to keep their hands in with physical tests of that kind without some practice. Can they do less and still be in practice. That is what I want to know ?—I cannot explain what you ask.

476. Can you explain the complaints ?—I think the Test Pamphlet itself is a sufficient cause of complaint.

477. You are not objecting apparently to the tests of strength of materials. There are so few of them you cannot object to them ?—But these are the results. I complain, primarily, really of this mode of a professional man pushing his wares.

478. I am afraid you will not find much sympathy with engineers on that subject. We are obliged to push our wares very strongly ?—Not in a consulting practice.

479. Perhaps not. Do you object to the large number of tests made of clinical thermometers ? Do you look upon that as a hardly dignified proceeding ?—No ; that is Kew work—standardising of instruments. The Laboratory is established partly for that purpose.

480. (*Mr. Chalmers.*) Almost like weights and measures and that sort of thing ?—Yes.

481. Somebody has to keep a standard and compare ? —Yes. That, I believe, is work of very great importance.

482. (*Sir John Wolfe-Barry.*) You gave certain instances of fees charged which you say are less than the ordinary custom. Can you give the ordinary custom from your own knowledge ?—No. This is not from my own knowledge. Really, those fees which I gave a list of were on a paper which was an addendum to Sir William Ramsay's evidence.

483. (*Chairman.*) Yes, Sir William Ramsay sent in that paper after he gave us that evidence ?—Then you have it already.

484. (*Sir John Wolfe-Barry.*) Then may we take that as authoritative ?—Yes, it has been very carefully prepared by the Institute of Chemistry.

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485. He gives in that paper instances where the National Physical Laboratory charges less than the usual professional fees, but does the same paper give a list of what are the usual professional fees?—Yes, in each case it states what the usual professional fee is, I think.

486. I saw this paper, but I did not know where it came from. I thought this was perhaps your own knowledge, because it says: "The testing of materials of construction. In the 1903 Pamphlet the fee for a single sample was 5s.; this was raised in 1906 to 10s. 6d, the more usual fee; though some charge 12s. 6d., and others as much as £1 1s." Those are instances you bring from Sir William Ramsay's evidence?—Yes.

487. I suppose then we may take it that where the usual professional fee is stated that has been ascertained to be the usual professional fee by a consultation at various laboratories?—That is so.

488. (*Chairman.*) I understand this evidence is supplied by the Institute of Chemistry?—Yes.

489. They take the responsibility of it?—Yes.

490. (*Sir John Wolfe-Barry.*) My reason for asking was that it seemed to deal with engineering to some extent, and therefore I did not know that you, or even Sir William Ramsay, could speak for these fees in an authoritative way. It would be very desirable to know what are the usual fees, if they could be stated in an authoritative way?—Yes. I think those usual fees have been ascertained in this way. Many chemists undertake that work in conjunction with mechanical testers, and that is the charge made.

491. But there is no scale of fees issued by the professional gentlemen as a recognised scale of fees. In each case it is dealt with by private arrangement?—Just so.

492. Therefore each person may have a different fee?—The Institute of Chemistry do not say it is a reasonable fee; they give the usual fee, as far as they know it.

493. You do not know it, perhaps, of your own knowledge?—No, not at all.

494. (*Chairman.*) I understand the usual fee is 10s. 6d. There are, however, some professional men who charge 12s. 6d., and others as much as £1 1s.?—That is so; but I think the next Witness, my colleague Mr. Blount, will know much more of this than I do.

495. (*Sir J. Wolfe-Barry.*) Of course, there may be cases where a large number of tests are made by one gentleman and only one or two by a competing gentleman, and the fees probably would be less in the case of a large number?—My colleague, Mr. Blount, will be able to give you all that information first hand.

496. Very well. The other matter I was going to ask you about was what you say about publication. Can you tell us what is done with regard to publication in Germany, the Reichsanstalt?—No, I do not know.

497. I suppose we can ascertain. You say an Advisory Committee would be a desirable thing to add to the present organisation of the National Physical Laboratory; but have you considered who the members of the General Board are?—No.

498. Would you allow me just to point out two or three? There is the President of the Royal Society, and the Treasurer, and the two Secretaries, and the Secretary of the Board of Trade. I will not read them all out. There is the representative of the Institution of Mechanical Engineers, the representative of the Institution of Civil Engineers, the representative of the Institution of Naval Architects, the representative of the Institution of Electrical Engineers, the representative of the Iron and Steel Institute, the representative of the Society of Chemical Industry. Is not that a fairly representative committee for the initiation of subjects, besides a large number of others, perhaps twice as many as I have read out, of scientific gentlemen. What better Advisory Committee could be suggested than one of that kind?—I have not considered this matter carefully. I only concur generally with Sir William Ramsay's view about Advisory Committees. I should have thought perhaps that large committee might advantageously have been broken up into smaller committees, which would have come more into contact with the actual work of the Laboratory.

499. I believe as a matter of fact there is an Executive Committee as well as the large committee. I am a member of both?—I rather meant a number of small committees containing technical men amongst their number, so that they should really be personally able to suggest subjects of research and investigation.

500. Any one of these gentlemen can suggest a number of things for investigation?—Would that be a part of their actual work?

501. Certainly. It has been done on many occasions. You may take it from me that I know several of the subjects, which have been reported on by the National Physical Laboratory, have been suggested as subjects for inquiry by some of the representatives of the various scientific institutions. That is what you had in your mind?—That is exactly what I had in my mind.

502. (*Mr. Chalmers.*) I should like to ask you a question or two to elucidate your view on fundamental matters. Take the case of what has been called reference. You might say that the National Physical Laboratory was or was not capable of being a universal referee; but you would not object, would you, to its being named as a referee in any contract between parties?—No. I do not see any objection to that. It is only that I think its capacity of acting is limited.

503. Quite so. But speaking for the Institute, or for yourself, you would not object to that?—No.

504. You would not object to, say, the Indian Government, which has no longer got Cooper's Hill, giving to this National Physical Laboratory its own testing work if it saw fit. By testing work I mean materials in the very worst sense which you have in mind for the general public. Do you see any objection? The fact that it is a Government Department is a point I want to lay stress on?—You see the number of materials is so varied.

505. Do you object to the India Office giving to a body, adequate or inadequate, its orders?—I disapprove of the India Office giving orders to an imperfect body at all, of course.

506. I do not suggest that they are adequate. I am only on the point as to whether they are to be restrained in the exercise of their free choice?—Not if the body is a satisfactory one.

507. What you do object to is this, outside reference cases, and outside Government department employment, you do object to what I think you regard as the National Physical Laboratory going into the open market and touting for orders in a field which you suggest is covered by private practitioners?—Yes, that is so.

508. In routine testing of materials and so forth?—Yes.

509. And you would restrict, as I understand, the National Physical Laboratory, outside reference and Government department questions, to works which are not testing works but are works for the pushing forward of the boundaries of human knowledge and research, on lines which every scientific man or technical man would suggest from their experience as the lines on which inquiry might usefully go forward. That is so apparently?—Yes, subjects which would be of wide utility.

510. Do you feel as regards the Advisory Committee somewhat shaken by what Sir John Wolfe-Barry has indicated to you as regards the actual composition of the advisory body now existing for the National Physical Laboratory?—As I understand from Sir John Wolfe-Barry a committee already exists, if it really participates in the work of the Laboratory I should think it is already discharging the functions which I have suggested.

511. If, for instance, you had got any question that interested you yourself that you could not give the time to work at, it would be possible, you understand from what Sir John Wolfe-Barry has said, for you to communicate directly with the Institution or otherwise, and it might be taken in hand?—Yes, if that is so.

512. So long as technical people and practical men engaged in work have the means of indicating to the Institution the problems they want solved, that is the main point that you have at heart, is it not?—Yes, that such men should have access to the governing body of the Laboratory.

513. You want the National Physical Laboratory in the main to be a scientific body, not engaged in commercial work, but engaged in pushing forward the bounds of human knowledge?—Yes.

514. That is the essential, as I understand it, of your evidence and your wishes?—Yes, and that the work need not necessarily be of a purely scientific nature but connected with industry and arts, provided that it is of interest to a large body of people, and not only to private individuals.

Mr. BERTRAM BLOUNT, called and examined.

515. (*Chairman.*) You are a Fellow of the Institute of Chemistry ?—Yes.

516. It is in that capacity that you desire to give evidence ?—Yes.

517. You have heard the evidence which has just been given by Dr. Frankland ?—Yes.

518. Do you concur generally with his evidence ?—Yes, I think so. There are one or two points I have my own views about. I think Dr. Frankland was kind enough to say that I might be of some assistance to this committee in elucidating the relations of the chemist and the mechanical tester, because he, perhaps too diffidently, said that he was not very well acquainted with that side of the work. It so happens that my own professional work takes me a good deal into contact with mechanical testers, and if it will be of any use to the Committee, of course my knowledge is at their disposal.

519. We should be very glad to have your views on that subject.—I think I might take it up at the point where there was a little doubt as to the fees which, presented officially in the name of the Institute of Chemistry, were arrived at after consultation among chemists like ourselves who are constantly co-operating with mechanical testers and whose fees we necessarily know, and they may be taken I believe, as substantially right.

520. (*Sir John Wolfe-Barry.*) Which fees may be taken as substantially right ?—That list.

521. You have no further list than that ?—No. In my opinion the functions of the National Physical Laboratory are properly denoted by the Report of the Treasury Committee of 1898 if that document is read as a whole and its spirit and intention are interpreted in the light of the evidence on which it is based. According to my understanding of the Report the work of the National Physical Laboratory is to consist (1) in standardising instruments, (2) in determining physical constants, (3) in testing materials. The first part of its work is a continuation and extension of that previously carried out at Kew. The second is new and very necessary. The third is also necessary, because up to the present time there has been little systematic testing of materials *qua* materials, that is to ascertain the properties of classes of materials, although there has been a great deal of commercial testing of samples of materials, in order to decide whether they are of a quality required by a given specification. I try to draw a distinction between the examination of the nature of materials and the commercial testing of materials, to see if they will pass a given standard. It would be of great public benefit and particularly would it be of benefit to the technical professions if the standardisation of instruments, the determination of physical constants, and the testing of materials *qua* materials, as distinct from the commercial testing of particular samples of materials, were carried out more completely than at present. I think I am only saying what all professional men would agree in, that we want more of this work done. It is the last two in which progress is especially necessary. All such work should be research work directed solely to public utility; no commercial testing of materials should be undertaken by the National Physical Laboratory. The testing of instruments is in a different category, as it is simply a continuation of the work of Kew. Perhaps you will allow me to say that that point was made perhaps not quite so completely as might be by Dr. Frankland. I think the work has been inherited from Kew as regards the standardisation of instruments, and we could not, therefore, go back on that. That is a closed page. I think that must be admitted. I think, sir, you drew a parallel between that class of work and the routine testing of materials. The standardisation of instruments has been already an established art.

522. With regard to that I think you say it would be quite appropriate work for the National Physical Laboratory to undertake, to extend that work of standardising ?—Yes.

523. The first part of its proper work you say is a continuation and extension of that previously carried out at Kew. That is the standardising of instruments ?—Yes. It appears to me that if the work of the National Physical Laboratory is directed to purposes of physical research—and in physical research I include physical, chemical and mechanical research—having an industrial bearing, its public service is incontestable; equally if its activity is directed to commercial testing the national advantage is sacrificed. If commercial testing is undertaken by the National Physical Laboratory much private wrong will be done. There are in this country many establishments built by private enterprise and conducted by private professional men whose practice would be ruined by the competition of a subsidised testing works, having both the cachet and financial backing of a Government Institution. This form of competition appears to me unfair and against the best interests of the public, because such a body will become bound in red tape and useless as a leader of technical progress.

524. There would be no question of the special advantage to a National Physical Laboratory owing to its having the financial backing of the Government, if the fees charged were higher than those charged by professional men ?—No, when it comes to a cash basis like that.

525. (*Mr. Chalmers.*) Surely that is not so ?—I am not an authority on economics.

526. Take a practical test. Let Mr. Jones be in practice. If his fee is a guinea, supposing the National Physical Laboratory fee is a guinea, for advertising purposes do you suppose Mr. Jones has an equal chance ?—No, that is not so.

527. I suppose in many cases they might charge 50 guineas ?—Yes, and people would still go to the National Physical Laboratory.

528. (*Chairman.*) In that case they would go to the National Physical Laboratory ?—For the cachet.

529. So far as the question of financial backing was concerned, if the fees charged were higher or as high as those charged by professional men, there would be no unfair advantage ?—No, my answer was addressed to the question of the facts as they are. The question of the publication of all the results of tests of material made at the National Physical Laboratory is bound up with the question of the complete abandonment of commercial testing of materials. If no commercial testing of materials is done and all testing is research, all results should be published for public use and the publications should be accessible and cheap. On the other hand, if the commercial testing of materials is undertaken at the National Physical Laboratory, the results should not be published, as they are either devoid of public interest or are of such private importance that their publication would destroy their value to the client who sent the material to be examined. I think, perhaps, two illustrations will make what I mean quite clear. A man sends a number of steel rails to the National Physical Laboratory to be tested. A great table, such as we are all accustomed to see, of these results is prepared, which is of interest to the contractor and to the engineer and to no mortal person besides. We do not want to publish that. That is one illustration. On the other hand a manufacturer causes a special alloy to be examined and its properties and the best methods of heat treatment ascertained. That is information so valuable to him that its publication would destroy the value of the research so far as he is concerned.

530. You are no doubt aware that the Treasury Committee recommend that the results of investigations undertaken at the request of private individuals should, except in special cases to be approved beforehand by the governing body, be published or be accessible to the public, even when the cost of the investigations is fully defrayed by the persons in question ?—That is so.

531. So that the Committee did have before their minds exceptional cases in which the information was not to be published. Do you admit any exceptions ?—I think it would be a matter for the discretion of the Executive Committee. I think it very undesirable that that sort of work should be sent to the National Physical Laboratory and its result, which might be of great public importance, withheld. In my belief, the industrial interests of the country will be best served by increasing the activity of the National Physical Laboratory in the determination of physical constants and the testing of materials *qua* materials, and by ceasing to compete with private agencies. The competition is one-sided, because of the prestige of a Government institution, quite apart from the fact that the National Physical Laboratory is subsidised. An illustration is afforded by the following analyses of a sample of commercial copper. I sent a sample under my own name to the National Physical Laboratory, I analysed it myself, and I sent

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another sample to Mr. Archbutt. The figures are here:—

—	National Physical Laboratory.	Bertram Blount.	L. Archbutt.
	Per cent.	Per cent.	Per cent.
Copper	99·480	99·39	99·35
Arsenic	0·309	0·40	0·41
Antimony	0·040	0·01	0·01
Lead	0·031	0·03	0·02
Bismuth	0·058	0·01	0·02
Iron	0·007	0·01	0·03
Nickel	0·029	0·02	0·03
Oxygen	0·087	0·09	0·08
Tin and Insoluble..	—	—	0·01
Total	100·041	99·96	99·96

It will be seen that the results of the two private chemists agree within experimental error, and that the figures of the National Physical Laboratory are considerably divergent. The figures of the National Physical Laboratory would suffice to condemn the copper, whereas it would be accepted on those of the private chemists, yet by the public the results of the Government institution might be preferred. It may be argued that the chemist at the National Physical Laboratory has only a moderate amount of experience in this branch of work; admitting this, it seems undesirable that he should learn his business at the public expense and to the detriment of the private practitioner who in part supplies the funds by which the National Physical Laboratory is supported.

532. Do you suggest that the National Physical Laboratory should undertake the testing of materials *qua* materials but no commercial testing?—Yes.

533. How are the staff of the National Physical Laboratory to acquire the knowledge which is required for the testing of materials *qua* materials?—That is a matter of organisation of course. To begin with, if I we o called upon to act as a sort of informal member of the Executive Committee, I should try to pick men who have had some outside experience, and then I should set them on to acquire the use of the testing machine, practise them in special forms of testing operations, analyses and so forth, and then, if necessary, invite the co-operation of specialists who would guide in their earlier stages these men who are learning to make tests in an accurate way.

534. The testing of materials *qua* materials I imagine would be a higher work. It is general investigation rather than special investigation; and general investigation would require more qualifications than the testing of samples?—The actual mode of testing is exactly the same and needs the same care and skill. The interpretation of that is a part of the investigation and requires a higher quality of mind.

535. It does seem, however, that you would be directing the National Physical Laboratory to undertake the higher kind of work without any necessary experience in the lower?—I think the experience could be got in two ways, first by getting the best men that the funds will allow, who have had previous outside experience, and in the next place put them to begin with at some simple exercises until their experience has been proved. In carrying out the physical investigation, we will say, of the properties of an alloy, the experiments can proceed at a very moderate rate, and the operator can go back and check them, and if he is not satisfied he can repeat his experiments for weeks until he is satisfied, and in the process of that he will acquire the necessary skill. That is a very different thing from undertaking routine testing, where a man must bring his skill ready made. The further development of the business of the National Physical Laboratory should, in my judgment, be solely in the direction of carrying out those physical investigations of public importance which at the present time can be done only imperfectly and very slowly by private enquirers. Correlatively with this, all commercial testing of materials should be abandoned. I may illustrate again what I mean from my own experience. At this moment in my place I have a small machine which I designed and put up, with the collaboration of some engineering colleagues, for testing material by shock. Engineers agree that that method of testing materials is of considerable importance. It is a growing test. It occurred to myself and my collaborators that the testing might be done with the test specimen in a vertical position, and that it should be broken without a notch, the specimen being held very much like an ordinary tensile test piece. At some sacrifice of time and money I erected this little machine. I told off one of my men, who was sufficiently skilful for the work, to look after it. Ordinary routine work came in, I became very busy, and I had to take that man off. That sort of work is badly wanted. Quite lately I learned that the National Physical Laboratory are at work on the same lines. I am not jealous. I will throw away my machine, and I shall be very happy if they will do the work.

536. (*Mr. Crossley.*) Their report is published here, I think?—Not of this particular machine.

537. (*Mr. Chalmers.*) Do you object to the India Office giving its work to this Laboratory if it sees fit?—It is a very difficult question.

538. Take it in the easiest form, as one of sheer principle?—Yes, it is the easiest form. Even then that is not quite easy, because it has been done already at a Government Institution, Cooper's Hill. It was pointed out that it was done at a Government Institution, and that makes me rather hesitate in my reply to you. I would rather this work was done outside, because I am convinced it would be better done by the specialist outside.

539. I grant you that for the purpose of argument, but why are we to interfere with the right of the India Office to select its own adviser?—No, I cannot deny that the Government, as well as the individual, has the right to send its work where it chooses.

540. The Admiralty Chemist does a good deal with steel?—Certainly.

541. You have no objection to that?—No.

542. And therefore I gather now you are prepared, as a matter of principle, apart from the capacity of the body, to say that the India Office or any other Government Department may send its testing work samples to the National Physical Laboratory?—The India Office stands on a different footing to my mind altogether, because it has had that work done at a Government Institution before. The other Government Institutions I am thinking of have had their work done by outside experts.

543. Why should not they take it away if they see fit?—On the ground of principle they have the right to take it away and send it to another tester if they like; but I do not think they have the right to send it to the National Physical Laboratory, because it is forbidden by this Treasury Minute of 1898. It is routine testing.

544. You base it on that ground?—Yes; but you see my difficulty about the India Office is that it has already been done.

545. But apart from Treasury Minutes, I think you would be prepared to agree that you must not fetter the discretion of a Government Department any more than that of a private individual?—I rather disagree with that. I think the Government Department has a greater obligation. If a private individual goes to a place where the work is imperfectly done it is very much his own affair; but if a Government Department does that it is a national concern. I am afraid I must go back to what I said just now, that I doubt whether you will get the best possible results from a body which is going to handle a great number of miscellaneous objects.

546. I have asked you your opinion, and you have given your opinion. Coming now to the points of reference, if Jones and Smith have a contract between them as regards materials, do you object to Jones and Smith agreeing that in case of doubt a reference as to the quality of the materials shall be adjudicated on by the National Physical Laboratory?—Yes, I disagree with that entirely.

547. That is the case of Jones and Smith. Now take the case of Elswick and the Government Department; do you object to that?—It is Jones and Smith.

548. You do object?—Oh, yes.

549. (*Sir Andrew Noble.*) You see the reason that certain firms want to have recourse to the National Physical Laboratory is that Government say, "We cannot throw doubt on our own people"?—Yes, I see the difficulty.

550. They say, "It is to be to our satisfaction, and the person who has made this test says it is so and so; we say it is entirely different." If we have a National Physical Laboratory, we have a recourse; if we have not, we have no recourse?—Excuse my asking a question; I only want to make it clear.

551. I will answer you certainly.—I was going to ask if you yourself had experienced difficulty of that kind.

552. Repeatedly.—May I be allowed to say that Government Departments are not always so hard-headed. I cou'd

give perhaps a smaller instance than comes in Sir Andrew's observation, but still it is a real instance drawn from my own experience. A dispute arose between a contractor and a Government Department; I will not say which Department. The contractor brought me a sample to examine. I examined it, and although it was a Department where chemists are permanently retained, the Government results were different from mine, and the Government Department accepted my results; I deduce that Government Departments will act reasonably with a contractor and accept an independent expert's results.

553. That may be, but in one of the cases I referred to we had the National Physical Laboratory's result, and a private chemist's result, and they were precisely the same, and the same as ours, or at least within an infinitesimal difference, while the Government test was entirely different? —Yes.

554. (*Mr. Chalmers.*) Coming to another point, the objections that you and those who act with you entertain are based less on the existing inroads into private practice than on the possible inroads. The inroads that you suggest are indicated by the issue of the Pamphlet. It is not the amount of work that is being done at the present moment? —To make my position quite clear, I may say that I do not object to inroads, because I am not suffering, nor do I feel much apprehension on the point. My objection is mainly a public one. Because I happen to be a chemist and engaged in the testing of materials it might be supposed I have an axe to grind, but really that is not the case.

555. But if that were the case it really would not be a serious matter?—Yes, but it was rather a false position I might have been in if I had accepted your suggestion that I was suffering, or likely to suffer, or apprehended suffering. But as regards the other thing, the amount of routine work that is being done, I believe that to be inconsiderable. The statement of tests done there wants a little analysing, and there is not the means of analysing provided. I cannot say really how many official tests, apart from the standardising of instruments, have been made, but, accepting the table on its face value, the quantity of routine testing is rather small.

556. It is a question of the future rather than the present? —It is a question of the intention shown by this pamphlet setting out the fees of the National Physical Laboratory.

557. That is what you want to put a stop to?—Yes.

558. Dealing with scientific work, not of testing of samples, and not of materials and so forth, have you any remark to make as regards the government of the Institution. Do you suggest it is not sufficiently in touch with technical people, practical men?—Here I speak with a great deal of diffidence. I do not really know sufficient about the present mode of the working of the Executive Committee to offer an opinion of any great value. But my feeling is—it is only feeling—that the Executive Committee is in some degree out of touch with the bulk at all events of that side of professional opinion with which I am acquainted.

559. Have you any remedy for what you regard as a grievance?—It is a little hard to suggest—when I own I have not given the subject very much consideration—a remedy at a glance, but I think something of the nature of that Advisory Board suggested by Sir William Ramsay has merits.

560. What merits has it got?—The merits which it would have, I think, would be that it would allow the expansion and the elastic status of the present Executive Committee. I would have this Advisory Board not a fixed board like the present Executive Committee, but a body that could be called in when specific questions arose.

561. Is that precluded at the moment?—No, I do not think so. I think it might be done.

562. (*Sir Andrew Noble.*) The Executive Committee is not fixed?—Is that so, Sir? I have only put this out as a suggestion. I do not profess to be an expert on the matter.

563. (*Mr. Crossley.*) You told us just now of a case of testing of copper where there was a tremendous amount of difference?—Yes.

564. Do you not think that points to the fact that these testers must get experience. Evidently the man who was wrong was not experienced?—I had to pay for his experience. I had to pay his fee.

565. That is not the point. Do you not think they must be experienced?—Yes, experienced, but it need not be gained in the National Physical Laboratory. It may be gained outside.

566. Why not in the National Physical Laboratory?—It certainly can be gained there if they like to take a man and train him before sending him to do his work. But it is surely wrong to train him on the public.

567. I do not know whether they do it or not?—I was the *corpus vile* on that occasion.

568. How many of these public testers would be wronged by any increase of work of the National Physical Laboratory?—I cannot give you the exact number. They are scattered about. I should say half a dozen.

569. Altogether?—Something like that in England. Sir John Wolfe-Barry will correct me if I am wrong, but I think I am right that a great deal of testing is done not at a regular establishment where it is always being done, but in some scattered places. Sometimes a college will have a machine. That sort of testing, scattered about, and not going regularly to one central establishment, is in the aggregate very large.

570. (*Chairman.*) Is not a college to some extent on the same footing as the National Physical Laboratory itself?—Surely the college is not on the same footing as the other, because only in some degree is it subsidised.

571. (*Mr. Crossley.*) Do you see any reason why the Government should not get the National Physical Laboratory to do its tests, just the same as its builds its own ironclads?—That is rather a wide question. I think I have to fall back on that Treasury Minute of 1898.

572. (*Mr. Chalmers.*) I might correct you; it is a Report of the Committee?—A Report of the Committee.

573. (*Sir John Wolfe-Barry.*) You could not give us any idea of the six establishments that you have got in your mind?—I do not know that I can give you the six, but I have got the names. Of course there is Kirkaldy; there is Stanger; there is Monkhouse and Burstall.

574. Those are all in London at present?—Yes; there is Nash at Sheffield. Professor Frankland made a list I fancy. There is Stead.

575. He is not mechanical?—Does he not do mechanical work.

576. I do not know?—Arnold does at Sheffield, but I suppose that is a college.

577. (*Mr. Crossley.*) Those are all mechanical?—Those are all mechanical. There may be others. I have not made any search, but I think you might take it there are about half a dozen.

578. (*Sir Andrew Noble.*) I asked how many there were not long ago, and I was told three. But apparently there are three in London?—There are three in London. I am not very familiar with what goes on in the Provinces about these things.

579. (*Sir John Wolfe-Barry.*) So far as mechanical tests are concerned, as you say they are done in other places that are not belonging to private individuals?—Yes.

580. I think one of the earliest was University College, and Professor Kennedy?—Yes.

581. Then there is the Peoples' Palace in Whitechapel. They do commercial testing?—I was not aware of it.

582. Of course in those cases they are more or less subsidised institutions?—That is so.

583. Very different in that respect from persons who have ventured their own money?—That is so, but they are not *ad hoc*, they do it by the way; they are educational.

584. The people you have in your mind, who might be injured in their private purse, are about six?—Yes.

585. You gave us instances of the fees being too low, as you take it, in the pamphlet?—Yes.

586. Do you know whether any representation has ever been made to the National Physical Laboratory as to the fees being too low?—I do not know that. I do not think that has been touched on. I regard the thing as a matter of principle, not of fees. I am not concerned about those fees. I object to the principle altogether.

587. Quite, but as far as you know no representation was made?—Not as far as I know.

FOURTH DAY.

Thursday, 25th April, 1907.

PRESENT:

The Right Hon. GERALD W. BALFOUR (*Chairman*).

Sir ANDREW NOBLE, Bart., K.C.B.
Sir JOHN WOLFE-BARRY, K.C.B.
Mr. W. J. CROSSLEY, M.P.
Mr. ROBERT CHALMERS, C.B.
Mr. G. C. UPCOTT (*Secretary*).

Mr. DAVID HOWARD, called and examined.

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588. (*Chairman.*) I think you are an ex-president of the Institute of Chemistry?—Yes, I am.

589. And also a member of the Executive Committee of the National Physical Laboratory?—Yes, I was nominated by the Society of Chemical Industry.

590. And as such you have had an opportunity of seeing something of the work which is carried on in the National Physical Laboratory?—Yes, I have watched it with the extremest interest.

591. Have you been favourably impressed with the character and utility of the work done there?—Exceedingly. Of course I do not speak as an engineer, because I am not one. I do not wish to profess to know what I do not know; but I do know something about physics, and the work is of the highest quality, the most minute accuracy, and of a very practical application. The working out of the problems of the constitution of alloys, the minute micrographic structure of alloys for instance, and the behaviour of metals under stress is of the greatest importance. It is a work of which it is difficult to overestimate the actual value, even from a commercial point of view.

592. Of course you are aware of the complaints which have been made with respect to the policy adopted by the National Physical Laboratory in connection with the testing of material?—Yes. As President of the Institute of Chemistry I think I have gone into that very carefully.

593. Do you think those complaints have been well founded?—I think there have been complaints of a danger. I do not think there has been any large extent of work which could be objected to. The question specially arose about chemical work. Chemical and physical work are very different, and I certainly would say that I do not think that chemical research is quite within the province of the National Physical Laboratory. The purely chemical research is carried on in research laboratories very well. Applied chemistry involves a sort of work which it is impossible for any Government Laboratory to carry out. There is not in chemistry that missing link which there certainly is on the physical side of the question. But we went very carefully into the question. The real question arose on a certain text book which described the work they were willing to do, which used rather general words. The fear was that these words would be interpreted to imply that the Laboratory was going to undertake mere chemical testing. I think that was cleared up, and I can only say that in the opinion of the Society of Chemical Industry, which I represent, there is no ground for fear from the chemical point of view.

594. At what time did you become a member of the Executive Committee?—About a year ago.

595. As such, did it fall to you to consider the complaints made by various chemical associations?—Oh yes, they were all brought before the Executive Committee and very carefully considered.

596. Then you think, so far as chemical tests are concerned, that what was legitimate in the complaints has been fairly met by the changes in the pamphlet to which you refer?—That is my opinion.

597. (*Mr. Chalmers.*) Is that the opinion also of the Institution that you represent?—It is not the opinion of all the members of the Institute. It is the opinion of a considerable number of members of the Institute. Perhaps I might put it plainly in this way. The only ones who I know are dissatisfied are those who go rather beyond chemistry into physics, that is to say, metallurgical chemists. I do not feel very competent to judge of their complaints, because I do not know much about that particular work. The exact line between the physical side of the question and the chemical one is perhaps more difficult to draw than it is in other chemical questions. It is very important not to interfere with the professional workers. I am not one myself. I know their use and I know their importance. It is an immense advantage that professional work should be done by independent workers. Of course it is largely specialised. A man takes up some one particular branch and does an amount of most valuable research work in that direction, and it is very undesirable to discourage those workers. On the other hand, there is work which is almost impossible for any individual to carry out, and that is the work which one would specially wish the National Physical Laboratory to undertake.

598. You say in the *précis* of your evidence that "the Treasury Minute under which the Committee act clearly lays down the principle. The endeavour of the Committee has been loyally to follow the intentions of that Minute." I suppose you are referring to the Report of the Committee appointed to inquire into this question?—I am afraid I used an inaccurate word. There is a rather short extract of the Report, as distinguished from the evidence

599. (*Mr. Chalmers.*) It is not a Treasury Minute?—No, as I say, I used a wrong word.

600. (*Chairman.*) I only wanted to clear up that misapprehension. The Report is the document you are referring to?—Yes, and that it seems to me lays down the principles, and it is of the highest national importance that those principles should be carried out.

601. You say the Report under which the Executive Committee act clearly lays down the principle. But of course you are aware that certain doubts have arisen as to the correct interpretation of that Report?—I never knew any document where doubts could not arise about the interpretation of it.

602. As you think this document clearly lays down the principle, perhaps you will state to us what you consider the principle to be?—I think, to put it broadly, it is to investigate physical problems which apply specially to questions of engineering. They apply perhaps more there than anywhere else. I refer to new problems, problems which there are really no efficient means of dealing with, and with a view rather to the elucidation of new problems than to the mere carrying out of particular experiments about particular materials.

603. (*Mr. Chalmers.*) Unless those materials were new?—Of course, new materials; and there are new problems about old materials. But I do feel there is a danger in this. It would not be good for the Laboratory, and it would not be good for commerce or for individuals, if the Laboratory degenerated into a mere testing shop. There is a little false analogy, I think, in some people's minds. They say you have an official test of a watch to test its time-keeping, but then that is a purely routine test, and undoubtedly there you get the importance of the Government cachet.

But I do not think it is desirable to carry that out into other problems, because you may have a Government test which is not necessarily perfectly accurate, which may be useful even. A good many of the rules about the question of testing spirit are not accurate, and they have not tended to progress, though it is necessary you should have a fixed test, and you must have it; but it has not been an entirely good thing that it should be done as a purely mechanical work.

604. When, in the Pamphlet of April, 1902, issued by the National Physical Laboratory, the authorities of the Laboratory announce that it will undertake all such tests of machines, instruments and materials as its equipment will permit, do you think that was carrying out the principal which you consider was clearly laid down by the report of the Committee?—I think that was one of those rather doubtful expressions which undoubtedly may be interpreted in two quite different ways. I think, as to the actual working of the Laboratory, since I have been on the Committee, that has been interpreted on the safe side and not on the dangerous side. Of course, that might imply a mere testing shop.

605. You consider that has been the case as regards physical tests as well as regards chemical tests?—The intention has been the same. I do not like to speak authoritatively about physics, because I am not physicist enough exactly to speak with authority, and I do not know enough of the professional physicists' side of the question to speak with authority about that side.

606. But, at all events, you think that, so far as chemical tests are concerned, there is now no reasonable cause of complaint?—I see no ground whatever.

607. What do you say to the argument which has been urged before us that it is necessary, in order that the Laboratory may be efficient in carrying out its research work, that its staff should have a considerable experience of routine work?—It is undoubtedly true to a very considerable extent. I do not think a doctor can make much progress in medical science unless he has been through the mill of walking the hospitals.

608. Then in order to ensure efficiency in research, do you think it is desirable that the Laboratory should be empowered to undertake a certain amount of routine work?—I think it should be done with the very greatest care, and only with the definite object, not of obtaining routine work, but of doing that amount of keeping in touch with practical work which is necessary. I would say the less mere routine work the better, because the mere routine work a laboratory boy can do.

609. You would recommend that routine work should be undertaken only so far as is necessary to keep the hand of the staff in?—That is it exactly.

610. To furnish the staff with sufficient practice to carry out research work properly?—Yes; not to undertake it all round, or as a rule, or else I am sure the Laboratory would degenerate into a routine institution, and the routine institution is just what we do not want.

611. Does not that present rather a difficult problem? If you would admit a certain amount of routine work, and yet not more than a certain amount, how are you to limit it?—That is undoubtedly the practical question, but I think that if those who are directing the work have a clear apprehension of the object of the work, it can only be really settled by practice.

612. You would not lay down any hard and fast rule upon the subject, but you would leave it to their discretion, after due warning of the dangers?—That is rather my feeling.

613. Do you think that the difficulty would be met to any extent by requiring that the Laboratory should charge fees at least as great, and perhaps greater, than those charged by professional men?—I think that is a very important point. If they charge, we will say, somewhat more than professional men, those would go to them who had some special object, something more than the commercial wish for a test, and then, I think, the work would probably be quite safely undertaken.

614. Then as regards publication of results, do you think that the publication of results should in all cases be insisted upon?—There comes a practical point. Theoretically, I should say it ought to be, but practically the work of the Laboratory can be very much extended for general benefit if they undertake particular problems, in which case I do not think it is fair to the people who pay for working out particular problems, that there should be an absolute disclosure, provided that the scientific side of the question should be disclosed.

615. And the same would apply, I suppose, also to the routine testing work; it would be ridiculous to publish the result of every routine test?—It would be absurd, but that rather tends to make my distinction. Unless the routine tests are done with the object of obtaining some general result which is worth publicity, I think they ought not to be undertaken.

616. Would not that have the effect of cutting off routine tests altogether?—I think not altogether; it would keep the routine tests within the limits which I have suggested.

617. At all events, would not the Laboratory authorities be confronted with a large number of cases respecting which it was extremely difficult to say whether a scientific problem of general interest was involved or not?—Undoubtedly, and therefore I rather deprecate a very hard and fast rule. I think I may say that the Laboratory authorities do endeavour to carry out the intentions which are put before them, and if they make mistakes they are only human.

618. (*Mr. Crossley.*) You object to routine work except just as practice?—That is distinctly my idea.

619. You want them to get just enough to keep their hands in?—Yes. You can hardly undertake much of research without getting a good deal of routine work in the process.

620. I quite agree. Then you would raise the fees, so as not to compete?—Yes, and then, as I say, if anyone wants a special test from a special authority, they will pay for it.

621. And with those few exceptions your objections would be withdrawn?—Entirely, personally. I think I should say I speak rather specially as a chemist, and I do not profess to give an opinion on the other side of the question, because I am not competent to.

622. (*Mr. Chalmers.*) As regards the relation between research work and routine testing, would you say that it is a general fact that a man of science engaged in research necessarily, or as a matter of fact usually, has any great mass of routine work to do?—If he has too much he will do no research. On the other hand, if he is absolutely cut off from the practically applied work his work will be purely theoretic, and will be only useful when it has been transmuted by the practical man. I do not want to make the National Physical Laboratory a mere theoretical Laboratory.

623. Surely if you are moving into research work you cannot research without the preliminary knowledge of the ordinary processes?—Undoubtedly not.

624. You must start with that as your equipment, and the question would be then whether you required to be put through the grammar again and again, if I may use that analogy, in order that your research might not suffer?—To a very limited extent, but there is the other side. If you are doing an immense amount of routine work you do not think from the research point of view. As long as you are doing work with the intention of finding out something new, even routine work is valuable. Directly the mere result becomes the end, then research is at an end.

625. You perhaps still adhere to your view that in order to research properly you must also test?—As little as possible. If you charged more it would probably have the beneficial effect of reducing it to problems. A test, where you know something depends upon it, becomes a problem.

626. Are you quite certain it would have that result necessarily? Suppose you charged 25 per cent. more than outside professional charges, is it not quite possible then a man for advertisement purposes might be willing to pay that?—If I caught anyone doing it for advertising purposes I should refuse it altogether, or charge him 100 per cent. more. I do not think the National Physical Laboratory ought to be made the basis of advertisements.

627. You are very certain and definite about that?—I feel that very strongly.

628. You see there is a kind of risk; there is at any rate the possibility of that risk?—I do not speak so much for myself, but I know professional chemists have always to be considering whether the request for an analysis is *bona fide*, or only to make an advertisement of, and we consider that they are bound to refuse the work altogether if it is to be used as an advertisement.

629. And a National Physical Laboratory must be above suspicion?—It must be that, and it is a prostitution of scientific work to use it as an advertisement.

630. You have got the risk, even with larger fees, that there might be this tendency towards prostitution. At the

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same time you feel there is a need for some amount of testing work in order to keep in the hand of the researcher for the research work which you regard as his chief and main object?—Yes.

631. You have got your difficulties as regards the outside work; people may try it on with you?—Yes, but I think one can generally find out.

632. After the event or before?—I think practically you can generally find out before what people are driving at.

633. You have suggested you would give a free hand to the executive as regards the amount of testing that they would do, this minimum amount of routine work. Would not that land you as an Executive Committee from time to time, just as a kind of probability, in the troubles which have led to the formation of this committee?—Undoubtedly it might, but then the Executive must face a certain amount of risk of being found fault with; that goes without saying.

634. (*Sir John Wolfe-Barry.*) You are ready to face that?—I have had my share of that in my life.

635. (*Mr. Chalmers.*) You might find yourself in the awkward position of feeling one way as a member of the Executive, and on the other hand the Institute of Chemistry might drag you into a different position?—I think the Institute of Chemistry or anybody else would find it a very difficult thing to drag me where I did not want to go.

636. They might make the effort?—They might make the effort.

637. Might not we possibly find the way of peace in giving the amount of practice required in connection, say, with the India Office work?—I had that in my mind, but I did not know that I ought to speak about it. I think, though some of my friends will be very angry with me for what I say, that the India Office work would afford a very excellent training school for the actual practical problems, which are constantly altering a little. I have known chemistry for 50 years, and it has altered a good deal, and so have physics even more.

638. You would think there was an adequate scope for that practical training which you regard as essential to keep in the hands of the research in the India Office work, say, or in other Government Department work?—Of course, I cannot say exactly how much it amounts to, but I think that is the sort of opportunity which ought to be taken.

639. Speaking as a chemist, and on behalf of the Institute, would you see no objection to a Government Department giving its work, if it saw fit, to the National Physical Laboratory?—May I make a distinction? I do not think the Government would be wise to give much of its chemical work to the National Physical Laboratory.

640. I am not asking about its wisdom, but about the propriety of its so doing?—I do not think the purely chemical work would be well taken away from where it is at present done. If there is a question which is a merely chemical question, and it can be brought before the Government Laboratory in the Strand, it will be done in a most admirable way. But then they always abstain from merely commercial questions, and if it is a commercial question I doubt whether it would be better done than it is now.

641. The India Office have a lot of commercial chemical work. Take steel for instance. The point I want to have your opinion upon is whether there is any objection that a chemist can take to that work being given, in the discretion of the India Office or the Admiralty, to the Chemical Department of the National Physical Laboratory?—I think the chemist will object, but I do not think he has any reason to.

642. (*Sir John Wolfe-Barry.*) What you have said with regard to the India Office would apply to all Government Departments?—I am almost inclined to think that if all Government Departments were to give their work to the National Physical Laboratory it might be enough to reduce the National Physical Laboratory to the testing shop that I deprecate.

643. But supposing they did, and supposing the staff had to be increased for the routine work, why should that interfere with the research which is carried on by a much higher class of man?—I speak from painful experience of myself. I know of the deadening influence of a vast amount of routine work.

644. That, I suppose, must depend a little on the management of the superintendent; he need not put a man to cut blocks with a razor?—No, but there is a danger, because the superintendents have a vast amount of routine. That does take a great deal of thought, and leaves a great deal less time for research, and brain power for research. I speak from painful experience in my case.

645. Then your fear is that there would be too much testing work?—That is my fear.

646. You do not object to it, I take it, because of the damage it might do to the private laboratories who do the same sort of work, but on the ground that it interferes with the research work?—I should be sorry to do any injury to any individual, and I think there would be some ground of complaint if it was injuriously taken from the individual. In the matter of the India Office work I do not think it is taken from any private individual at all. It has been always done by the India Office; of late years at any rate.

647. Of late years, but it was not always done?—No. I think undoubtedly if that routine work was always concentrated in one place its quality would not improve. There would not be the rivalry which there is between different testing laboratories, which is a very wholesome thing. If you get them all under one Government you have no rivalry, and you have not that wholesome rivalry which is the secret of all progress.

648. We heard that about six establishments for physical testing might problematically be affected by the operations of the National Physical Laboratory in what is called routine work; I am not talking of chemistry?—Now you are getting beyond my personal knowledge.

649. That evidence was given to us?—Yes. I should imagine so, but I do not know.

650. Do you think there is any risk of those six establishments being shut up by anything that has been done or is likely to be done by the National Physical Laboratory?—I think you are more competent to answer that question than I am, sir. I have heard serious warnings.

651. You have been on the Committee; that is why I asked that question.—I have had serious warnings, but I had better not express a personal opinion.

652. I should not have asked the question but for the fact that you have been on the Committee, and you have already said that as far as things have gone at present no harm has been done?—To the chemist, but I do not express an opinion, because I do not think a mere chemist ought to express an opinion, especially about the practical side of this engineering question.

653. But a good deal of your evidence has been directed to the routine work of testing such as is done with steel and materials of that kind?—I think I may judge so far, not speaking from my own knowledge, that the mere routine work of testing steels would probably be better done really outside the National Physical Laboratory. It would rather degrade the Laboratory. It would stop the wholesome rivalry of different schools of testing, which is a very important thing, and if the National Physical Laboratory came in at all I should say let it come in as arbiter to decide between rivals; not to crush the rivals out.

654. That was the question I was going to ask you next. In the evidence given before the Committee in the Blue Book, the desirability of some Court of Appeal of testing was specifically alluded to?—Yes, that I read with great interest and great approval; but then the Court of Appeal must not be litigants themselves.

655. I was only confining myself to that particular branch of having a laboratory where matters could be authoritatively disposed of on the question of strength of material?—I should say that was of extreme value. May I give a somewhat imperfect analogy in the Food and Drugs Act; what we incorrectly call Somerset House, the Government Laboratory, are the Court of Appeal. I do not say they are always right, but I do say that their decisions are unimpeachable. I have an uncomfortable feeling, when I say they are wrong, that I may be, and probably am. They stand exceedingly high, and I think that is just because they are not actually engaged in the work which they have to judge. I mean they are not engaged in the actual work from which the appeal comes.

656. (*Chairman.*) Unless appeals of that description were sufficiently numerous themselves to provide the amount of routine work which you think desirable, they would have to obtain that experience of routine work in some other way, either by undertaking commercial testing to some extent, or by doing Government work?—I say if they do Government work it would give it them, only then there is no appeal in that case. The only disadvantage would be that there would be nobody to appeal to in the Government work.

657. (*Sir John Wolfe-Barry.*) Unless the Government were content to take the National Physical Laboratory as an authority ?—Yes. It would deprive the Government of their appeal. I do not think that would be a very serious matter.

658. On matters of that sort, the Government or anybody else must appeal to somebody in the last issue ?—Yes. In that case the first hearing would be the appeal.

659. Of course it might or might not be. If there was a difference of opinion there might be a necessity to go to the Court of Appeal ?—What I mean is, supposing the National Physical Laboratory undertook the testing of Government materials for, say, the India Office, if there was a doubt about their result you could only appeal back to the same court, which is a disadvantage. The more you reserve the National Physical Laboratory as the Court of Appeal, the stronger will be the force of its judgment when it gives a judgment.

660. That argument, for what value it has, would be against their doing any Government work then, *ab initio* ?—I only say that is the only disadvantage of their doing Government work. On the other hand—it is an imperfect world, and it is never logical—unless you have something of that sort to keep them at work on they are not a good Court of Appeal.

661. (*Sir Andrew Noble.*) I imagine that the National Physical Laboratory was formed for three things : First, as a Court of Appeal ; secondly, for carrying out original research ; and, thirdly, for carrying out investigations that might be paid for by private firms ?—Yes.

662. It was done for those three things : you agree to that, do you ?—Yes ; I think that exactly describes it.

663. In the first place as to chemical tests, it is of very high importance that people outside the Government should have a Court of Appeal. The Government, of course, will, I imagine, use their own physical laboratory for their own experiments, and so on. But it is important that people, for example, who contend that certain Government Departments have made a mistake, should have the Physical Laboratory as a Court of Appeal ?—In physical questions.

664. No ; I have commenced with saying in chemical questions, and I want to have your answer to that point, too ?—I do not think as a matter of fact they would be a good Court of Appeal in chemical questions.

665. Why not ?—Because unless they did all the work of the Government Laboratory, I do not think they would get practice enough.

666. In the few cases in which I have referred to them, the National Physical Laboratory have confirmed very closely a distinguished private analyst.—In the only case which I know where the National Physical Laboratory made a very great mistake in chemistry, it so happened that they were opposed to the Government Laboratory, and they were quite wrong ; the Government Laboratory was quite right. I am bound to say it would suit me much better if I could go to the Government Laboratory as a Court of Appeal more often than one can, because I have the highest opinion of their work.

667. That is the point, but for the outside manufacturer it is of great importance, and I can say that it was borne in mind, when the National Physical Laboratory was established, that they should be able to deal with these questions. If they can do chemical work, do you see any reason why they should not do it ?—It is perhaps an impertinent thing to say, but I do not think on the chemical side, apart from physical chemistry, it is strong enough to make a good Court of Appeal.

668. They had better make themselves strong enough ?—It would be rather expensive.

669. Are there not plenty of chemists to be got ?—The only chemists who can decide these questions are those who are actually engaged in the work themselves, either as manufacturers or as professional men. I do not know what the points are that you have in your mind, but my experience is that on the difficult points one would not go to the most scientific man one could find by any means, because he probably would not understand the practical bearing of it.

670. Should not the National Physical Laboratory be as able to give an opinion upon chemistry as upon physics ?—I think I know more chemists than most people, and I am sure I do not know where I should find one, except in one place, and you would not get him from there, and that is in the Government Laboratory. The men there are the only men I know who are not engaged in actual work as manufacturers or as consulting chemists, who have that peculiarly wide knowledge of chemistry which is required ; and when you have got him I do not think the number of cases would be enough to keep him going.

671. I think the cases that are referred to public analysts by manufacturers are generally simple. They are not very difficult. In the two cases that I am referring to three outside analysts were unanimous practically. Now, what is wanted, and I want your opinion upon that, is that as in physics so in chemistry, you ought to be able to get an opinion, and the advantage is that departments will acknowledge a Government authority when they will not acknowledge a private analyst. That is the point ?—But I think it would be a great disaster if there were two Government authorities pitted one against the other. I do not know what the case is, but in such a case as that I can only imagine that it is a question involving a good deal of pure theory and a good deal of practice. The only person I can imagine fit to decide that would be a judge of the High Court, who would listen to the arguments on both sides and decide, and he probably would come to the right conclusion.

672. But a Government establishment is the point ?—Then, as I say, it would be a disaster. I cannot imagine anything worse than one Government department pitted against another. You had better have injustice rather than that.

673. (*Mr. Chalmers.*) You thought it was degrading to go into too much testing work, but you would consider it would be, perhaps, a disastrous form of degradation if one Government department was called in merely to upset another Government department in the interests of a private contractor ?—I should say it was a most evil thing, and in that case the probability is that the Government department that was appealed against had immensely more practical experience than the Government department to whom the appeal was made.

674. (*Sir John Wolfe-Barry.*) Is not there a difference between the National Physical Laboratory and a Government department ?—But if it was treated as a Government department, you could hardly appeal from a Government department to it.

675. (*Chairman.*) If I understood rightly, your view is that the National Physical Laboratory can do useful work as an Appeal Court ?—In its own line, but not in chemical lines, I am sure.

676. (*Sir Andrew Noble.*) Why should you say that chemistry should be excluded ? In my opinion chemistry is likely to embrace all the sciences ?—Chemistry is a pretty wide subject, I admit.

677. I need not refer you to the many authorities upon that point ?—By this time I know my profound ignorance of it.

678. I will give you an example. If an inspector finds certain slight differences of colour in steel for certain purposes, he may say it is not to his satisfaction. Now, I have seen a case recently where forgings were condemned for these differences of colour, and the whole of the articles complained of stood twice the test of pressure and still were rejected. If that case were referred to the National Physical Laboratory, and the National Physical Laboratory gave their opinion that they ought not to have been rejected, it probably would have weight with the department, whereas anything that a private experimenter said would be disregarded ?—That would be most emphatically the sort of problem that the National Physical Laboratory can deal with. Here is an unusual colour in steel ; does that mean anything physically ? That seems to be the problem. That is emphatically the work they ought to do.

679. (*Mr. Chalmers.*) Was not the case that Sir Andrew was taking rather one of the interpretation of a contract ; have not we got practically the condition of a contractor who has entered into certain obligations and submits himself to the satisfaction of a certain individual, and then the individual gives his decision, and the contractor then wants, if I may use the word without disrespect, to wriggle out of the result of his contract ?—If a contractor has agreed to supply something of a particular quality he has no right to substitute anything of another quality, even if that is as good, as far as regards the contract. That I do not think can over-ride the wording of a contract. That is a question of law.

680. (*Sir Andrew Noble.*) You are acquainted with the Reichsanstalt, are you not ?—I am acquainted with it ; I have not had immediate dealings with it.

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681. You are aware that they undertake chemical tests ?—Yes, but I venture to think that they are not quite as good as the English tests.

682. What is your objection to chemistry that it should not come under the National Physical Laboratory ?—I will take the Reichsanstalt. I think that has had a distinctly dwarfing effect on professional chemistry in Germany. It has rather narrowed the lines on which the tests are to be made, and the result is that it discourages individual effort, and I confess from what I have gathered that the result is that the testing is not as good as it is in England, whereas the rivalry of men who are running against one another makes them all sharp.

683. You are aware that German manufacturers and German chemists place great confidence in the Reichsanstalt, and are of opinion that the Reichsanstalt has helped them very much ?—It is not an ideal arrangement.

684. (*Chairman.*) Has the Reichsanstalt in Germany encroached on a field already occupied in that country by private enterprise ?—No, I do not think there was private enterprise there.

685. There is a difference in that respect between Germany and England ?—Yes, I may be wrong, but I am of the opinion that by being first in the field they have rather dwarfed the lines of research in professional chemistry.

686-7. (*Sir Andrew Noble.*) You are aware that German manufacturers and German chemists use tests to a much larger extent than is done in this country ?—I know the working of German manufacturers better than most people, and they use them to a very much larger extent than is done in this country by unwise persons, but not to a larger extent than some factories.

688. Is it your opinion that the result of the experiments carried out by the National Physical Laboratory at the cost of private firms or individuals should be published to the world ?—I think that which is paid for should not be. I said that I did not think every detail should be published, but I think the scientific results should be published. I think there is a distinction. When one goes to a doctor he does not divulge one's particular case, but if there is any scientific result he is bound to publish it. I mean medical etiquette requires him to make known any general result which he learns from his own individual practice, but he certainly does not publish the individual case.

689. (*Chairman.*) There is just one point I should like to clear up. You stated that you thought the Laboratory could do useful work as an appeal court, provided one of the parties to the appeal was not another Government Department ?—Because there never should be an appeal from the Government.

690. May I call your attention to a sentence in Section 9 of the Report of the Committee of 1898 ? " In particular the Committee desire to draw attention to the evidence which has been laid before them as to the difficulties arising in certain Government Departments in their dealings with contractors and others which might be overcome by the establishment of an independent testing authority." Therefore, it is clear that the Committee considered that that was one of the cases, perhaps the only case, in which the Laboratory ought to act as an appeal court ?—I think they may appeal from a Government servant to a higher authority. That is hardly from one department to another. What I had in my mind was, supposing there was an appeal from the court of appeal, which the Government Laboratory is in the case of the Foods and Drugs Act, it would be a disaster to have a second appeal.

691. You were considering a case in which a decision had been given by the Government Laboratory at Somerset House ?—Yes.

692. Which decision should be submitted for final ruling upon by the National Physical Laboratory ?—Yes, that is what I mean.

693. I do not think that is what Sir Andrew meant ?—I think in a question, say, between a contractor and an inspector, the matter should not be *res judicata* till it has been referred. But I think when the Government have once decided the Government must be held to be right. What is meant there, I think, is that there is no one to whom the Government official can appeal.

694. (*Mr. Chalmers.*) The chemistry of steel is what we are thinking of. If there is a question whether steel is according to contract, Sir Andrew wants another appeal outside the Government ?—I think it would lead to very serious difficulty, unless it could be an agreed reference, that is to say unless it should be distinctly understood that the National Physical Laboratory was the appeal court.

695. That would be part of the contract ?—Yes, part of the contract.

696. (*Chairman.*) I gather from what you have said that you would not object to the National Physical Laboratory acting as a court of appeal as between private individuals ?—Not in the least. I think it would be a desirable thing, only of course it must be by agreement.

697. (*Sir John Wolfe-Barry.*) May I ask one more question ? You have several times used the expression that the National Physical Laboratory is a Government Department. Of course you know that it has got a much wider basis than a Government Department ?—Yes, and I only used the words " Government Department " on the question of an appeal from a Government Department, because I think it would become a Government Department if it was a Government court of appeal. It is not a Government Department.

698. It is not a Government Department. I wanted to clear that up in the evidence ?—I am glad you have mentioned it. It is only from the point of view of the appeal that I used that word.

699. Yes, because, just to get it on the notes of the evidence, the National Physical Laboratory is supported by most of the leading technical institutions by very considerable yearly subscriptions ; is it not ?—Yes.

700. And also by individual subscribers, manufacturers and others, and consequently the National Physical Laboratory has a far wider basis than a Government Department, such as an Admiralty testing establishment ?—Undoubtedly ; and it would make a very good court of appeal if it was agreed, but, as I say, the Government must be final.

Mr. Edward Wyndham Monkhouse, called and examined.

Mr. E. W. Monkhouse.

701. (*The Chairman.*) You are a partner in the firm of Burstall & Monkhouse, Consulting Engineers, of 14, Old Queen Street, Westminster ?—Yes.

702. And also a Member of the Institution of Civil Engineers and of the Institution of Mechanical Engineers ?—Yes.

703. Will you shortly describe to us the kind of work that your firm carries on as commercial testers of materials ?—Yes. At our office we have a laboratory in which we have installed a machine for breaking iron and steel bars and other metal specimens, for making tensile, bending and torsion tests. On that machine we make tests of samples of materials sent to us by consulting engineers and others, and have made at times tests for the Board of Trade, particularly tests of copper pipe specimens when they have had an investigation to make into some copper which has been submitted to them by some particular manufacturer.

704. (*Sir John Wolfe-Barry.*) What is the power of your machine ?—50 tons. I think, sir, we used to make tests for you for the Natal Government Railways, in succession to Sir Alexander Kennedy. In addition to these mechanical tests, as I may call them, we make tests of electrical apparatus, that is to say we make conductivity tests of trolley wire and cables used for tramways and electric lighting purposes. We also make cement tests, tests of cement briquettes, the cement being sent to us by architects, engineers and others.

705. (*The Chairman.*) Do you consider that your field of operations has been invaded by the National Physical Laboratory ?—Until a few months ago I do not think it had, but our operations were invaded some time ago by the transference to Cooper's Hill of a lot of work which we originally had, that is to say, the testing of specimens for Indian Railways. Sir Alexander Kennedy originally did the greater part of Sir A. M. Rendle's testing, which was mainly work in connection with Indian Railways. That work we took over when we took over Sir Alexander's laboratory and it was subsequently transferred to Cooper's Hill.

706. (*Sir John Wolfe-Barry.*) That is some years ago is it not ?—Yes, it is a good many years ago now. It was very soon after we first started. I do not exactly know the date, but I should imagine it was probably in 1897 or 1898.* That work we have got back again temporarily.

707. (*The Chairman.*) From the Indian Government ?—We have not got it directly from the Indian Government, we have got it from the man who is making chemical analysis for the Indian Government, a man who was at Cooper's Hill, Mr. Harbord. Of course when that work went away from us to Cooper's Hill, it did take a good deal of our testing income away from us, and now that we have got it back again of course that testing income has come back to us. I understand this testing work is going to the National Physical Laboratory, and therefore to that extent when the National Physical Laboratory does take this testing we shall be harmed.

708. If, however, the entire work of Cooper's Hill had been transferred, without a period of transition, to the National Physical Laboratory, you would not as a matter of fact have had any work taken away from you by the National Physical Laboratory. The hardship on you was inflicted at the time that the work was given to Cooper's Hill by the Indian Government ?—That is so.

709. (*Sir Andrew Noble.*) How many years ago ?—I cannot give you the exact date, but I think it was in 1898. It was somewhere about 1898.

710. That was before the existence of the National Physical Laboratory ?—Yes. We took over Sir Alexander's testing laboratory in 1896, and my impression is that we had that testing work for about two years ; I cannot say how long.

711. (*The Chairman.*) Can you tell us whether other engineering firms besides yourselves have made complaints or felt that the work of the National Physical Laboratory interfered with their business ?—Speaking of commercial and mechanical testing, at the present time I do not think any of the people I know have been interfered with, for the simple reason that the National Physical Laboratory have not done any mechanical testing to speak of. The reason they have not done it is they have not had a machine to do it on. They have now ordered, and I believe are about to get delivered, a powerful machine, I believe a 100-ton machine as we call it, and I understood that when they got that machine they were going to lay themselves out to take these commercial tests.

712. It is what will happen in the future rather than what has happened in the past that you are afraid of ?—Yes, it is prevention rather than cure. We are afraid of what may happen in the future.

713. Do you wish to refer to the evidence given before the Committee appointed by the Treasury in 1897. I see you mention it in your *precis* of evidence ?—In this connection, that it seems to me personally and to other people that no State-aided Institution should be allowed to compete commercially with any private firm.

714. (*Sir Andrew Noble.*) How about the Royal Arsenal ?—That is rather a different thing, is it not ? I think you can hardly put the Royal Arsenal on all fours with the National Physical Laboratory, because the Royal Arsenal is an institution which is run to provide materials for the defence of the country supposing all the contractors in the country refused to do so. Besides the Arsenal does not compete with contractors for any work, even for Government Departments, so far as I am aware, and certainly does not compete for work required by private individuals or companies.

715. (*Mr. Chalmers.*) Historically, is it not the fact that the intruder is not the Government Department but the outside contractor ?—In the case of the Arsenal ?

716. Yes ?—It may be. I do not know enough about it.

717. (*Chairman.*) Are there any special passages in this evidence to which you desire to call attention ?—Yes, there are. Lord Kelvin was particularly strong in his evidence in saying that if an Institution of the sort that was then under consideration was brought into being it should not in any way compete with private people. You will find that, I think, in Answer 1115 in the evidence. Mr. Gray, of Silvertown, in 1461 and 1482 also brought that out.

718. Of course you are familiar with the Report of the Committee in 1898 which practically embodied, I think, Lord Kelvin's advice ?—Yes.

719. At the same time that Committee did specially recommend that a public Institution should be founded for standardising and verifying instruments and for testing materials ?—Yes.

720. What kind of testing of materials do you think was contemplated ? I take it that what was contemplated was the investigation of any particular material ; that is to say, supposing a man had a material the properties of which he wanted investigated in a scientific way, and a way which would come under the heading of research, I take it it was intended that the National Physical Laboratory should be able to carry out such an investigation, but that the National Physical Laboratory should not carry out tests of samples of materials which were to be used for constructional purposes, like rails, or girders, joists, and the like.

721. Do not you think it was the intention of the Committee that the Laboratory should in certain cases act as an appeal court in such matters where a difference of opinion had arisen ?—This is Clause 9. I rely almost altogether on Clause 9. Clause 9 is really the clause on which I go when I say what I do say in my evidence.

722. I quite understand that, but I should like to know what you think this second sentence in the clause refers to ?—Do you mean " In particular the Committee desire to call attention to the difficulties arising in certain Government Departments in their dealings with contractors and others " ?

723. Yes ?—I have read the evidence given before the Committee with a view to finding out what that did mean, and the only evidence I can find is that given by Sir Wm. Anderson, I think, and it was on the subject of guns and crusher gauges.

724. In the Report it appears in a general form. The Committee say they have had their attention called to these cases, and they appear to agree that in cases where difficulties have arisen the Laboratory could usefully act as a Court of Appeal ?—I do not think the Laboratory can usefully act as a Court of Appeal at all. I do not think they could act as a Court of Appeal in any case which involved the employment of a staff of very experienced and expensive experts. If this Laboratory is going to be under the wing of the Government, the Government could not afford, or would not afford shall I say, a staff of men of sufficient experience to act as referees in all cases which might be referred to them. Besid s which it is obvious that no institution subsidised by the Government can act as a referee between a Government Department and a contractor.

725. Then we are to understand that this is a recommendation of the Committee to which you, yourself, personally would not agree ; I mean the recommendation of the Committee in Clause 9 ?—Do you mean that particular part of the clause ?

726. Yes, that particular sentence implies a recommendation to which you personally would not agree ? —I do not agree that the National Physical Laboratory should be made a referee in all matters between the Government and its contractors.

727. I understood you to say that the National Physical Laboratory could not usefully undertake the duty of referee, because to do so would require a more extensive staff than could or would be provided ?—That is one of my reasons for it, yes.

728. Your conclusion is that that is not a duty which ought to be entrusted to the Laboratory ?—I conclude that it is not, that the Laboratory could not undertake it.

729. (*Sir John Wolfe-Barry.*) Whatever the Committee might have meant to say ?—I do not think the Committee quite meant the thing to go so far ; that is my private opinion.

730. (*Chairman.*) Will you proceed to the next head of your evidence. You say that " it is impossible for any institution, body or individual to undertake research work and commercial work with the same staff and on the same apparatus ; that if the two classes of work are to be done, a separate staff and separate set of apparatus must be devoted to each " ?—Yes.

731. Several witnesses before us have urged that the research duties of the Laboratory could not be effectively

* *Note added by Witness.*—The date at which the testing work of the Indian State Railways and Indian Store Department was transferred to Cooper's Hill was in the autumn of 1886. The transfer to which the witness referred was that of the testing work of the Bombay and Baroda and other Indian Railways at the end of 1899.

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carried out unless the staff had considerable experience in routine work. That seems to be opposed to the opinion that you have expressed in your *précis* of evidence?—It is, and it is not. If you combine that with the last clause altogether in considering the question of the research work, if you take the last clause of the *précis*, I made a suggestion there. I said that I thought the having of such an Institution was a most excellent thing, because the Institution would have expensive instruments and so on, which could not be provided by private people, and I thought it was an excellent thing that people who had scientific questions to refer, or which they would like to refer to some body, should have such a body to which they could refer. But I suggested that the person referring the question should have some say in the way in which the experiments should be carried out, and should also be kept informed as to what was being done during the run of experiments. My reason for suggesting that was this, that people who are practically engaged in designing schemes do come up against difficulties. We do come up against difficulties, and there are things on which we should like experiments made to help us to get over those difficulties, and it seems to me that we practical people who come up against difficulties could help the National Physical Laboratory or any like Institution to carry out experiments which might clear the matters up.

732. I quite understand that. It does not seem to me altogether to meet the point of the argument to which I have referred. Just let me repeat it. The argument is that in order to carry out research work successfully those who are carrying it out must have a considerable amount of practice in routine work, and it is further said that that practice in routine work can only be acquired by doing routine work?—I do not agree.

733. All I wanted was to elicit your opinion?—No, I do not agree with that.

734. (*Sir Andrew Noble.*) You do not agree with what? I thought the statement seemed pretty clear?—I do not agree that the actual people engaged in carrying out research work need of necessity be practical men. As a matter of fact, the people who do most of the research work are not what you would call practical men at all.

735. (*Chairman.*) You would apply that also to the staff with which they would have to work. You see, research would be carried out, I take it, in many cases by more than one individual in co-operation?—Yes.

736. There might be the highly-skilled scientific man whom you have in your mind, but in addition to that he must have a practical staff at his disposal?—He must have men to work the apparatus and to carry out his instructions.

737. Would you go the length of saying it is not necessary for those men to have experience of routine work?—Routine work, so far as the actual operation of the machine is concerned, yes.

738. But how are they to acquire that?—They would learn that to some extent before they go there. They would go in as underlings, and grow up acquiring further knowledge of the use of machines in the ordinary way.

739. But do you think they would have enough work of that kind if all commercial testing was rigidly excluded?—I say they ought not to have commercial testing at all, and if there is not enough work for them to do in making researches, then there is no reason for them to be there at all.

740. That is not quite the point, is it. We are now on the point of experience and skill required for research work?—May I be allowed to say that you asked me just now whether I thought they would have enough to do if they did not undertake commercial testing. I think that was your question?

741. Enough of it to give them the requisite experience for carrying out research work? That is what I intended to ask.—I think I have already answered that in saying that I do not think that the men who actually work the machines, or who actually work under the instructions of the principal, need have any routine work, or what we call commercial work, to enable them to carry out their duties satisfactorily.

742. Then you think that the principal assistants, at any rate, stand in no need of any routine work?—Not commercial routine work. I am perfectly sure from my own experience that routine commercial work and research work cannot be carried on by the same, shall I say, gang of men, because if you have men working on research, and you have to take them off the machine, or off the apparatus, and put them on to commercial work, they lose the thread of what they are doing; also the machine or apparatus would have to be dismantled and got ready for the commercial testing work, and if it is a special research it may take a very considerable time to dismantle and to re-erect it. Some things which come under the heading of research are in the machine for months at a time. I have got two instances of research work which have had to be put on one side to make way for commercial work, which we have in our office at the present moment. We have some steel bars which Sir Alexander Kennedy had made before we took over the office from him, and on which he was carrying out some research work. They are there still; the work is not finished. I have got a research going on on copper wire, with regard to the effects on it of loads which come on it owing to snow, wind pressure, and so on. Specimens of the wire have to be broken on the testing machine, and probably just as work has been started on them there come along some commercial tests which have to be made at once, so that materials may not be kept waiting. The research specimens have to be put on one side, and as a matter of fact are put on one side and remain so for months at a time. That is why I say the same staff and machines or apparatus cannot do research work and commercial work at the same time.

743. Obviously there must be some division of labour in all institutions of this kind?—I say that if the two things are to be carried on at Bushey, you want two separate establishments entirely, two separate machines and two separate staffs.

744. (*Sir Andrew Noble.*) You think that anyone who makes tests is unfit for research work; is that it?—No, not at all.

745. (*Chairman.*) You are afraid if the Laboratory undertakes commercial testing on anything like a large scale, all competition will be shut out, and that tests will thereby be stereotyped?—I say that competition will be killed, not shut out.

746. Do you think that that result would ensue, even supposing the Laboratory was to charge higher fees than are ordinarily charged by professional men?—No, I do not think is would ensue at first, but what I think would happen would be that when the Laboratory discovered that they were not getting as many commercial tests as they expected to get, they would bring their fees down to a lower level, and so attract work to the place.

747. If they were forbidden to do that, would that to any extent meet your apprehensions?—If they were absolutely forbidden, and forbidden for all time, and the forbidding was made so that it could not be got round, it would meet my fears.

748. Does the Laboratory at present charge competitive fees?—For mechanical testing?

749. Yes?—I cannot say what they actually charge. I have seen two of their pamphlets, one of which was issued somewhere about 1903, I think, and the other in 1906. The fees in the 1903 pamphlet, as far as mechanical tests were concerned, were about half, or less than half, of what ordinary people charge. My recollection of them is that they quoted 5s. a specimen for ordinary tensile tests when single specimens were sent, and a lower fee if they were sent in quantities. In 1906 they issued a pamphlet in which that fee was raised, I believe, to 10s. 6d. a specimen.

750. Could you give us a list of the cases in which the fees charged by the Laboratory, according to these pamphlets, are below those ordinarily charged by professional men?—I just give you those two because I happen to remember them.

751. I do not say now on the spur of the moment, but could you furnish us with such a list?—If I am provided with lists of the Laboratory fees I can compare them with the fees charged for testing by ordinary people.

752. There is no difficulty in getting the booklets published by the National Physical Laboratory. I have no doubt the Secretary will provide you with them. I understand that if effective means were taken to prevent the Laboratory from competing in that way you would not consider that any of these results which you fear would follow, at all events they would not follow in any formidable measure?—If the Laboratory were made to charge very high fees, and were prevented from ever altering those fees, I have no doubt, as I say here, that the competition would be minimised. I do not think it would be altogether removed, but I think it would be minimised.

753. One witness has suggested to us that it would be a desirable thing to establish consultative committees representing the various branches of industry, including

the testing of materials, and attach these to the Laboratory, and has urged that if that were done, in the first place certain problems which it is desirable should be worked out would be brought to the notice of the Laboratory and secondly, that it would enable the Laboratory to make sure that it was not charging fees lower than those ordinarily charged in the trade. Have you any observations to make upon that suggestion ?—It seems to me that the suggestion as to the formation of committees to deal with the various things submitted to the Laboratory is quite a good idea, and really it is an elaboration of my own suggestion, as given in the last clause of my *précis* of evidence, I think. It is on the same lines as my own suggestion.

754. Such a committee would, I presume, have no difficulty in keeping the Laboratory informed as to the fees ordinarily charged for the same kind of work. Is that so ?—Of course, the fees that are charged by the various people are pretty well known, and there would be no difficulty in informing the Laboratory of those.

755. I do not think steps ever have been taken to inform the Laboratory. We know from the evidence given before us it is not the intention of the Laboratory to charge lower fees than those ordinarily charged, and yet you say it has done so in a good many instances ?—No, I do not think I said it had done so. I think I said that in the pamphlets issued the fees quoted were lower than those which are usually charged.

756. (*Mr. Crossley.*) You seem to imagine that this Laboratory would do such an immense quantity of research work and such an immense quantity of commercial work that one staff could not get through it all ?—No, I do not think I have said so.

757. You said you did not see how the staff could get through the work ?—No, I do not think I put it that way. I think I said that any staff that was engaged in research work could not also be engaged on commercial work.

758. Why not ? I keep a staff engaged on both. It seems to me the kind of experience you get on professional work helps you with your research work ?—I do not know what your business is, sir, but anyhow, you are only carrying out researches in connection with your own particular business, I take it. Now the National Physical Laboratory would have to carry out researches, and would carry out researches in connection with any number of different businesses.

759. The whole thing seems to be a sort of fear of competition. You are afraid of competition even if the fees are put up ?—Looked at from the lowest point of view, that is to say, from the point of losing money, I am afraid of the competition.

760. Supposing the fees were doubled, would not that protect you sufficiently ?—No, I do not think so. I think the principle of any State-aided institution entering into competition with any private institution is wrong.

761. Why should not the Government do its own testing of its own materials ? Why should not the India Office send its materials to be tested to another Government Department ?—The India Office, as a Government office, might do what it likes, but the Indian railways are not Government. There is a great deal of private capital in the Indian railways. They are not Government railways in the true sense of the word.

762. Do you see any reason why the Admiralty should not send samples to be tested by the National Physical Laboratory ?—If the National Physical Laboratory is a Government institution, it appears to me that a Department of the Government has a right to do it. I think you must look upon the Government as a whole. I think it is a great pity the Government does not look upon itself as a whole. I think it is a great pity that it has so many departments. It is too departmental as it is. There is some evidence to that effect, which I think was given by Major Cardew, as he was then.

763. (*Sir John Wolfe-Barry.*) How many private testing establishments are there in London like yours ?—Only two others, I think.

764. What are their names ?—Kirkaldy, and Stanger.

765. Kirkaldy, I suppose, was the originator almost of private testing ?—I think he was. He has been going for about 40 years.

766. You say your attention was drawn to the lowness of the fees in the pamphlets ?—Yes.

767. Did you bring it to the notice of the director of the National Physical Laboratory that they were very low ?—No, because it is only quite recently that I have found it out.

768. But if you had found it out earlier you might possibly have brought it to his notice ?—Yes, I think I might.

769. Is there any recognised tariff between we will say the three establishments in London, your own and Kirkaldy's and Stanger's, as to the fees for tests ; I mean, definite things such as rails, or specimens of steel or cement ? Is there a recognised tariff agreed between you three ?—No.

770. Then it does not follow that you all charge the same fee ?—No, as a matter of fact I do not know exactly what the others do charge.

771. Then it is not unnatural perhaps that the Director of the National Physical Laboratory did not know. You do not know, and he did not apparently. He said he had no idea of undercutting the private establishments ?—The Director of the National Physical Laboratory certainly did not know the cost of making tests when he quoted 5*s.* for a specimen.

772. That is not quite the question. He had no real means of finding out what the fees charged by private establishments were ?—As far as I am aware he did not take any trouble to find out. He might probably have found out if he had taken the trouble.

773. (*Mr. Chalmers.*) But you could not say what they are. You could say what your own are ?—We could say what our own are, and if such a question had arisen no doubt it would have been gone into.

774. (*Sir John Wolfe-Barry.*) Is Mr. Blount a partner with Stanger ?—Not now, I think.

775. They have dissolved partnership ?—Yes, I believe so.

776. Mr. Blount is entirely a chemist now ?—A consulting chemist.

777. (*Sir Andrew Noble.*) Supposing you are sent steel to test, in what form does it come to you generally ?—Sometimes it comes to us in the rough and we get specimens from it ; at other times the specimens come ready prepared.

778. And of course your price would be very different ?—When we have any machining to do we just charge the client the cost of the machining, whatever it is. It varies according to the specimen.

779. When they send you a sample ready for testing, do you examine it and gauge it, and all that ?—Yes.

780. And that would be included in your fee ?—Yes.

781. What points do you test. Do you take the elastic limit ?—We take what is called the elastic limit, that is the breakdown point of the material, not the true elastic limit. We take what is generally known as the elastic limit, and we take the tensile strength.

782. There is no mistake in what they mean generally by the elastic limit, is there ?—Yes, there has been a good deal of discussion as to what is the elastic limit, or what is to be taken as the elastic limit, in a test. Is it to be the yield point. The elastic limit and the yield point of course you know quite well are not quite always the same. There is very often a considerable difference between them.

783. The reason I am asking is because the cost would depend very much upon some of these points. Do you take simply the breaking ?—No, we take what is called the elastic limit. We measure the extension, we measure the reduction of area, and we report all these, reporting also in some cases what is called the work, which was a thing instituted by Sir Alexander Kennedy.

784. Do you take the bending ?—If we are told to.

785. And do you take it hardened and unhardened ?—If we are told to do so, yes. We carry out the instructions of the people who send the specimens to us.

786. You agree with what the Chairman said, that if the National Physical Laboratory named prices that shall not be below yours ; if the three people in London agree as to what they consider theirs, you would agree that if the price is considerably above yours, that would not be a cause of loss to you ?—No ; what I said was it would minimise the competition.

787. All large manufacturers, I suppose, have their own testing machinery ?—They have.

788. From what source do yours come then generally ?—Our specimens come from consulting engineers and others who want to check tests.

789. (*Chairman.*) Is there any other observation you

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wish to make?—No, only that I would like to emphasize Clause 9 of the Committee's recommendations, with which you are probably very familiar. The part I would like to emphasize is the part which begins, "It would be neither necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories. But there are many special and important tests and investigations into the strength and behaviour of materials which might be conducted with great advantage at a laboratory such as is contemplated in the reference." I agree with that entirely.

FIFTH DAY.

Thursday, 2nd May, 1907.

PRESENT:

The Right Hon. GERALD W. BALFOUR (*Chairman*).

Sir ANDREW NOBLE, Bart., K.C.B.
Sir JOHN WOLFE-BARRY, K.C.B.
Mr. W. J. CROSSLEY, M.P.
Mr. ROBERT CHALMERS, C.B.
Mr. G. C. UPCOTT (*Secretary*).

Mr. WILLIAM G. KIRKALDY, called and examined.

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790. (*Chairman.*) You are an Associate Member of the Institution of Civil Engineers?—Yes.

791. A Member of the Institute of Mechanical Engineers, a Member of the Iron and Steel Institute, and a Member of the Royal Institution?—Yes.

792. You are, I understand, the surviving partner in the firm of David Kirkaldy & Son, Testing and Experimenting Engineers?—Yes.

793. I think the late Mr. David Kirkaldy was the pioneer in introducing and standardising tests upon practically all kinds of materials used in construction?—Yes, he did a great deal of pioneer work.

794. We shall be happy to hear any criticisms you wish to pass on the National Physical Laboratory in connection with the testing of materials or otherwise. Perhaps you will follow the lines of the Abstract of Evidence which I have now before me?—Yes. I wish personally to look at the subject under two headings—one as an experimenter, trying to keep that apart from my own establishment—that is, my pecuniary interest. I think I can give evidence in that way, and then later on I wish to speak from the personal side. I want first to keep them separate, and I may commence by saying that I was thoroughly in sympathy with the establishment of a National Physical Laboratory. I was very glad when it was mooted that we should have one in this country, and that is still my feeling. Then after it had been fairly set going, I was still equally satisfied, and I thought it would not affect me personally owing to the carefully defined scope of the Laboratory. I have included here section 9 of the Blue Book. "It would neither be necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories; but there are many special and important tests and investigations into the strength and behaviour of materials which might be conducted with great advantage at a laboratory such as is contemplated in the reference . . . . . We could give other instances of the same nature, and have merely referred to the above subjects as examples of such matters as would in our opinion be proper for an investigation at a public institution, as distinguished from the ordinary testing of materials used in commerce or in construction and machinery which can be, and is now efficiently conducted at private establishments." No doubt you are aware of the terms of that. It seemed to me quite clear that at that time they had established the National Physical Laboratory for research work and investigation, and not for commercial testing.

795. Would you say that in the view of the Committee, which reported in 1898, it was to be confined to research? That would be going too far would it not?—I would rather put it in this way, that the Committee distinctly hedged in or confined its sphere so that it was not to include commercial work. Research work was to be the main function of the Laboratory, and then the investigation work, which could not be done in the ordinary way by private people. But I had better keep principally to the point that it was not established for the purpose of doing commercial work that could be done elsewhere. That is the way I read section 9, and, therefore, I did not need to take any steps to protest or move at all. It is at page 3 of this Blue Book.

796. I think we are all so familiar with Section 9 that it is quite sufficient for you to call our attention to the passages?—I only call your attention to it to show my personal feeling. I felt quite comfortable about it. I felt it was just the Institution I would approve of, and that I need not worry at all as to its affecting me prejudicially. Perhaps I need not labour that point. I might now put in my view as an experimenter. I find extreme difficulty in the testing establishment to conduct the routine or commercial work and at the same time overtake research work. I do not particularly care for the word "commercial." It has a savour of cheapness or roughness about it. I prefer the word "routine," but perhaps we had better keep the word "commercial" in. In my own case my commercial work is done as accurately as my research work. We make no distinction. We would not like anyone to call us a commercial establishment, for though we have to live by it we keep it up to a high grade. I find it very difficult to carry out those two classes of work in the same establishment, and I venture to give my experience as a reason why I think it would be very difficult for the National Physical Laboratory to do both. I think practically it is very difficult. In my own view, commercial work, if you do it at all, has to be done so promptly that everything else must stand on one side. However interesting a series of tests may be, you must put them aside to do the commercial work, and you must take up this research work when you can. In my own case it is mostly done after hours, and myself and my staff frequently work very late at night. It would present difficulties.

797. Would not that rather depend on whether you regard the commercial work as your *raison d'être*, or the research work?—Yes. If you are going to do commercial work principally, and you let the other be subsidiary, of course the research work must take its time. I have to do the two because it is my living, but personally I like to do as much research work as I can. As long as I can do sufficient commercial work to get the bread and butter, I like to have time to do the other. I go on later to say that if you should want to do the two it would

almost mean practically duplicating the staff and the apparatus.

798. Do you not think that your own research work would suffer if you had no routine work to do? Is not the doing of routine work of some service to you in research work?—A person wants certain wide experience. Perhaps I might illustrate it in this way, On commercial work you have to have your experience, and you have to make your experiments in the very best manner, issue your figures, sign your report, and then you have to stand by it. With research work you can, I think, approach the subject in a more leisurely way. You can always repeat your experiments, and repeat, and repeat, and repeat until you get all your methods in the most perfect manner.

799. Would you go so far as to say that you think an institution could carry out research work better if it had no routine work at all?—I think I might go that length. It would not be hampered by not having routine work.

800. (*Mr. Chalmers.*) You feel clear about that, do you?—Yes, because if they wanted experience on that research work they would make preliminary experiments. That is my own way of working up to it. Perhaps I have to take up a subject sometimes that I have no personal experience of. If it is research work I can manage by making preliminary experiment and narrowing it down. I train myself to that particular research, so that you can conduct research work, I consider, without the routine work experience.

801. (*Chairman.*) Your experience derived from commercial work must be valuable to you in research work, must it not?—All experience is valuable, no doubt. But you could do research work without. For instance, in my own case I think I might say I would enjoy my life better if I could live solely by research work, as my father had originally expected, and so be able to let the commercial work slide. We have been driven into the commercial work to keep our head above water, so to speak.

802. You personally have acquired a great deal of skill in commercial work already, no doubt?—Yes, I have had over twenty years' experience in very varied work. Of course, I am putting my own views before you, and you will attach your own weight to them, but I want to give you the benefit of my own personal views. I think that covers the point where I am speaking as an experimenter, apart from whether I have a business of my own or not. Then I think we might go on to the second section, where I want to look at it more bluntly and plainly, where my own interests are at stake. In that connection, perhaps, I am not putting it too strongly in saying that I consider it unfair that they should do commercial work in competition with me, because they are subsidised and I am not, and they have that great advantage over me.

803. Do you lay stress upon the fact that they are subsidised as a reason for their not competing with you?—That makes it more difficult for me.

804. But only in so far as it will enable them to charge fees below the ordinary fees that are charged by private people?—They could charge less than I could live at.

805. That objection would be done away with, would it not, if they were forbidden to charge fees below those ordinarily charged in the profession?—It would lessen the competition, certainly, but still, I do not see that it would rectify the matter, *i.e.*, if I am right in my view that they were not intended to come in on the commercial side. That is the view I take.

806. I suppose it is really what you apprehend in the future rather than what you and firms like yours have suffered in the past that you would lay stress upon?—I am much more anxious about the future. I have suffered up to the present, but not on any great scale. I have not worried about it so far, and I may tell you that I have not made any fuss or raised any complaint. This is the first time I have ever taken any steps in the matter.

807. If the routine work was confined within strict limits would you still object to it; for instance, supposing the work of testing materials did not extend beyond reference testing for the purpose of settling some dispute which might have arisen, or, again, work undertaken by way of investigation for some private person or firm?—That would certainly be less objectionable from my point of view.

808. Would you object to the Laboratory undertaking Government work?—That is a difficult point. I think if one Government Department chose to refer it to them they would be at liberty to take it, because it would be in the national interest. But that I think is on a different footing from the wholesale indiscriminate commercial testing.

809. Yes, but I was suggesting that though routine testing might be permitted to take place it should be strictly limited. I was asking your view upon that?—I think it should be carefully watched, that it should be within limits, that it should only be that work which should be distinctly for the general benefit. If the investigation work offered by a private man would benefit the other engineers when the result was obtained and published, I would say as an engineer let us have it. But each case would want to be weighed on its merits.

810. You think such a question might be reasonably left to the Executive if the principle was understood?—If we could settle the principle, I think one could trust the Executive. If they considered the case on its merits, and if the investigation work promised good results, I should sink whether I lost financially by it. I should take the higher ground. Supposing I lost, if it was for the general benefit I should think I ought to waive that point. But the case would have to be considered on its merits I think, and looking at it from the point of view of the public interest, looking at it from the point of whether engineers are going to benefit by this investigation, if it was very promising in good results, then I think it should be undertaken, but only in such clear cases.

811. You would object in any case, I understand, to the testing of samples as such?—Yes, I think that should be ruled out absolutely.

812. (*Mr. Chalmers.*) Except for a Government Department?—It is even objectionable there, I think, because I may tell you that for many years my father and I have had the honour of testing in dispute cases in most Government Departments. We have tested in that way regularly for the Admiralty, and the Office of Works, and so on. So that personally I should be sorry to lose that, and not for the mere money so much as for the prestige. It would be a sort of slight on me; it would seem rather that I was not good enough to hold the work. I am just giving my personal views.

813. (*Chairman*). And you would object to the testing of samples even if the fees charged by the National Physical Laboratory were above those charged by the profession generally?—It is not quite the thing, I think, that they should compete commercially, and it is bordering rather near that. But I think that would be a case that would have to be considered by the management. I would prefer the old system of a Government Department picking out the specialist that they consider most suitable for them.

814. Do you know whether samples are ever sent from this country to the Reichsanstalt to be tested?—These are practically none or very few cases, but I think there are some cases, and, curiously enough, one has just come through my hands, for instance, a new process of steel making. A patentee has come to me and he wants independent tests. He has sent to me a number of samples, and he has said to me: "Now, Kirkaldy, will you be good enough to mark certain samples and certify them and send them to Charlottenburg?" I said: "I shall be very pleased to send certified samples over there, and then you can have the Continental tests for any interests you have on the Continent." In this country my own report would be taken; but if he thinks of moving in Germany, the Reichsanstalt certificate would be more useful to him. Where Continental interests come in it is naturally better for them to have the Continental certificate; but I think in this country I have the honour of my reports being very widely accepted. I am also likely to send samples in the same way to the Conservatoire des Arts et Metiers. If they are wanted for France I shall send duplicate samples of my own, so that he shall have the French certificate.

815. You do not think there would be any danger, if the National Physical Laboratory were to refuse to undertake work of that kind, that it might be sent to the French Institute or to the German Reichsanstalt?—No, I do not think so. I think we have men in this country who have such a long experience and reputation that they would get the work. I have not known of a

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case going out of the country purely because we could not do it.

816. You have not known any such case?—No.

817. You have not known any case where the certificate, as it were, of the German Government Institution, or the French Government Institution, was sought for for its authoritative value?—Not for circulation in this country. In their own country, yes.

818. But take a neutral country like Belgium or Italy?—I have no personal knowledge of any case that I can think of just now. No, I have not had a case that I remember on that point. I should not like to say it has not been done. A German would naturally, I think, lean to his own Government establishment, and so, if he were sending goods to the Colonies and he wanted a certificate, he might in that case send a German certificate, and probably our own officials would not refuse it; as long as it bore a Government stamp it would be good enough for them.

819. You know of no case where goods have been tested in Germany or in France with a view to the value of the Government certificate in some neutral country?—No, not to my knowledge; not samples sent from this country to another in order to get a foreign certificate.

820. Will you proceed with the next point which you wish to raise?—I think there is one point which I have in my mind which has something to do with the Government giving out the testing work. Perhaps I might put it in this way. Personally, I want very much to uphold the prestige of our National Physical Laboratory. I am still with them, because all these little things have not turned me against them. I want to keep up the prestige of our country. I know the Reichsanstalt, and when I was over there some years ago I was greatly impressed with their magnificent place. I came back slightly downcast with my own private establishment, which, although very complete for a private establishment, seemed so small in comparison, and, on the other hand, I thought it a pity that the old country had not an equally fine Institution. We want to keep up the prestige of our National Laboratory now we have one, and in that sense we have to consider whether its prestige would not be lowered by the commercial side. I think it would. They will have ample work, I am sure, by steering clear of the pitfall of the commercial side. Personally I can only argue against the commercial side being included.

821. Of course you are aware that the Reichsanstalt does undertake commercial work?—Yes; in that case the circumstances were rather exceptional. There was no private establishment of the kind in Germany. I cannot say this officially, but I remember my father saying that many years ago the German authorities went over his works, and he rather had the feeling that they reported to their own Government on the strength of what they had seen at his place done in a private way, and they said that Germany must now do something similar, and he thinks that that was the beginning of the Reichsanstalt. I cannot say that officially because I have no proof, but I have heard my father speak of the visit from these engineers.

822. So that, as regards routine testing in Germany, there was a void which did not exist in this country?—That was it. We pioneered it here privately. In Germany they started with the Government establishment; therefore, so far as I know, they did not injure any private man. It was all good, and no possible harm to anybody.

823. Would you object to the Laboratory undertaking work which is not at present undertaken by any private firm, although that work might be of a commercial nature?—There would be less objection to that, but I would rather put it perhaps this way: My own feeling is that I would be very glad personally if they would do the pioneer work on the newer kinds of tests that are wanted. I have less and less time now, but if they would standardise the tests for the general good I would certainly like that.

824. Even if those tests were of a commercial character?—Yes, but I should like them to standardise. I should like them to say after thorough investigation: This is the best kind of test for this new material; will you follow on these lines? In that way they would pioneer for us. But I think it would be a little dangerous to advise their having a scope to continue these routine tests.

825. You think they might undertake commercial tests on new materials until the tests for those new materials had been thoroughly established?—Yes. If they investigate the best means of testing, that is certainly for the benefit of every one of us, myself included. My father and myself have had to do that, first inventing one apparatus and then another, and perhaps a third; and the cost of the earlier apparatus, if superseded, was money gone.

826. That remark rather illustrates the difficulty of drawing the line?—It is difficult.

827. (*Mr. Chalmers.*) What would you call the newer kind of materials?—I should have said perhaps newer tests for the present materials.

828. (*Sir Andrew Noble.*) You cannot ask the man who has not done any tests at all to give an opinion: he has not sufficient experience?—In that case there are certain difficulties, but I do not think they would be serious, becaus they should have always first-rate men at the National Physical Laboratory, and they have the advantage of the best apparatus. In a case like that I think the man who is bringing out the new material could give them a lead for the direction of their research or investigations; he could give them a help that way; but, if not, I think there are plenty of men in the country who would be very glad to do anything they could. I think I might say for myself I would always do anything I could to help their research work forward, unless of course they took the view against me that they could compete with me. I think the men at the National Physical Laboratory should be quite able to contend with special research work, because I have to do it in my own case. I cannot know everything, and when a new problem comes along I have to worry at it. I have the advantage of friends who help me. I help them in what I know, and they are very good in reciprocating. We have to work these new things up, and a very difficult job it is sometimes.

829. (*Chairman.*) And so far as work of that kind is concerned you would not object to the National Physical Laboratory undertaking it, even though it might have a commercial character?—It would be a matter of give and take. But after they had standardised it and got it into running order it would then become a sort of commercial work. Personally, I am only concerned really about the broad issues. On the purely commercial work I think they would lose prestige in doing it. I do not think it would be to their best interest to do it. I want to put that apart from my own personal interest, because it does not matter to the nation whether I go under or not. It certainly would be very hard on myself, personally, but it would not vitally matter to anyone else. But, if I am pushed out and they do not give equal facilities, my wide experience of course is lost, and my accumulation of apparatus is lost; and, in that sense, I think I may say, in no boastful spirit, that it would be a distinct loss both to the Engineering profession, and also to manufacturers.

830. Yes, I quite appreciate your point of view?—I am afraid I am going into it much more fully than I thought. You have touched that point about charging lower fees, and I think you have put it exactly from my point of view. I think it would be very objectionable if they charged lower fees than professional men do, because that would be really too much; it would swallow every one up.

831. I may tell you I know it is not the intention of the National Physical Laboratory to compete unfairly in that way?—No. I think that would be a very wrong move, because they would lose prestige, and gain a great deal of opposition too. In fact I should have to oppose them in that case, and fight for my life. I do not want to do that. You will notice I point out that it does not alter the principle or morality of the proceedings, even if routine work were done by the National Physical Laboratory at a higher fee. That of course is for you to consider. I am against the commercial side there. Perhaps I might say a word or two about that. Supposing we assume that I get squeezed out, there is all the work we have been doing, and I think it has been appreciated, but there is especially the great collection of apparatus we have got. I have got a tremendous store of things that have been gradually designed for special tests wanted by one man and another. If I go under, who is going to have it? it then becomes only scrap. If I went under, those people who came along with these odd tests would naturally fly to the National

Physical Laboratory and say, "You must help us." Then the staff would have to design these odds and ends which we have been doing for so long. They could not charge a man for that particular apparatus. I take the risk. I say to myself: "Someone else will want that test, I will make the apparatus." Or I do it frequently, though not justified from a pecuniary point of view, for the sentiment of not being beaten, as well as to help wherever practicable.

832. I think you may take it for granted that the Executive Committee have no desire to squeeze out private firms?—I thought not. I felt it would be too bad if they did. There has never been any antagonistic feeling between myself and the staff. I have been on a very good footing with the men, the little I have come in contact with them. Then I touch on the point that the National Physical Laboratory could help me by this standardising work—investigating the principles underlying various tests. That is, I think, distinctly one of their functions, to find out better methods of testing. We have had to pioneer that in the past, but I do not want to always do it. I should be very glad indeed if they would give special attention to that. I think, sir, those are the two points. I have tried to look at it in the two ways.

833. (*Mr. Crossley.*) I should like you to make clear what you mean by better methods of tests. Take the testing of material. What material have you in view?—I have in view just now work I am trying to do, but it has been spread over a long time owing to other work; and that is, the effect of shock on metals. We want to have some standard method of testing metals by shock. I have made a little apparatus for it, and I have got some very nice results, but the apparatus is barely finished before I see I can make a better one. I am afraid I shall have to do it in half-a-dozen different ways before I find I can cover the ground. The National Physical Laboratory are doing it, fortunately, and I am very glad to see they are, and in that case I can hold my hand and not design a lot of tools. I shall keep the subject going. I am approaching it a little differently from Dr. Stanton, and I may be of some use. But if they get that right in shape by experimenting on different forms of tests and then inform people which is the best test for shock you can have, it saves us from worrying to complete about half a dozen different methods of testing for shock.

834. (*Sir Andrew Noble.*) I understand you to say that it is an investigation which the Laboratory might fairly undertake?—Yes, I am with them in that. That is a very good point. That is what I mean when I speak of the newer methods of testing. It is not new in this sense; my father had thought of doing it many years ago, but, among many other things, it has not been completed. It was on his programme, but he was not able to carry it out. He wanted also to test metals under stress and impact at the same time, but that apparatus was never finished.

835. (*Mr. Crossley.*) Then I understand you would like to shunt all those things on to the National Physical Laboratory?—It would not be healthy to shunt them all on to them, but we would have their help to carry them on. I do not want to stop my own work because we have the National Physical Laboratory. I want to contribute my share as far as I can.

836. Everybody seems now to want the shock test?—Yes, everybody is mad on shock tests now. I am only afraid we are running too far. Some men are swearing by shock tests beyond anything else. There are a great many pitfalls about shock tests to my mind. Though I know half a dozen different ways of doing them, I am afraid five out of six may be misleading. There is a lot of pioneer work required, as I say, to get it standardised, and if they could do that, personally I should be very grateful to them. I want to have shock tests, and I cannot make up my mind which is the best. I should be very careful not to introduce a test which was not a good one. I want to know beforehand that it is really a fine test.

837. You say there is a difficulty in doing both commercial and routine work. Would not that depend altogether upon the quantity of the commercial work? Supposing only a little commercial work was done in order to keep one's hand in, would there be any objection?—There would not be any special objection perhaps, but there is this difficulty unless you are prepared to have special machines. Perhaps I could illustrate that. If I am set with a testing machine for research work, I want to keep straight on, perhaps for several days ahead, and keep all the apparatus set and the instruments going, and my mind on the train of thought all the time. But it is very exasperating to me if a messenger arrives with one or two samples and says, that an answer is awaited. Perhaps I have to put my research work away, and I do not get to it again for another week. I have to disturb my instruments for this thing, and if I refuse to do it, of course, it is my living, and people will say, "Do not send it to Kirkaldy, he will not oblige us." Supposing we grant for a moment that the Laboratory might include commercial work, I think you would have to provide special machines that could be set to do the commercial work when it came.

838. Then really it would not be a question of two staffs, but of duplicate apparatus?—Duplicate apparatus. I do not think it is the best thing for a man who is engaged on critical work to have his attention taken to other things. But it can be done: I do it myself, and have to do it.

839. Supposing these fees were 50 per cent. higher than ordinary professional fees, would that eliminate all risks to private interest?—Oh, yes, I think it would practically do a great deal that way, although there are men who are so keen to get a Government certificate that they would pay double or treble the amount for it. But I am trying to look at it from the point of view of the National Physical Laboratory. The question is, would it pay them to do that; unless they had a big run of commercial work, would they earn enough fees to make it worth the doing? That is what I think has to be considered. If you get only a few (and you would only get a few, comparatively speaking, by charging the higher fee), would not you lose money and would it not be a white elephant, whereas if you do it cheaply so as to cater for a large amount you are doing men like myself an injury. But I prefer to keep to the question of principle, the question whether it is a good principle or a bad principle.

840. You say you have suffered?—Yes, I have suffered. I know definitely three or four cases of work going from me to the National Physical Laboratory and there may be many others which I cannot trace. But up to the present I have not worried, because I took the spirit of the thing; I thought the loss of work experienced was just a sort of fortuitous circumstance, and also at present they have not got the appliances to tackle my work. But I have to look ahead, to what it may be in five or ten years' time, when they have the apparatus, and also the special experience, because, mind you, those men will always be gaining special experience, and their reports will then carry more weight. They will be earning their position, just as we have earned ours. I have to look ahead and see how the commercial work, if permitted, would affect me. I should hope I would not go under. But we must look ahead; it might squeeze me out as well as other men.

841. Do you think you ought to be protected?—I think so. We have never asked for a subsidy from anyone; we have been very independent, but I think now we ought to ask for justice, or some protection from unfair competition.

842. Is not commercial work done at Woolwich?—At Woolwich they have never taken outside testing work. They do their own work, and no one can grumble at that.

843. You only make mechanical tests?—Yes, I give the chemical tests out to specialists. We have a small laboratory in the place, but we have never issued chemical reports. My father took the view that if chemical work was wanted he could not do the chemical work himself, and therefore it would be advisable to give it to a specialist, and let him issue his report and sign his report, and then each man would stand responsible for his own report. I have kept that up myself.

844. Have you tested cements?—Yes, all kinds of materials.

845. Does the National Physical Laboratory compete in that branch?—Not at present. Of course it must be remembered that hitherto they have not had the appliances. I could have brought you a list of the materials we test, but it includes, I think I may say, all materials used in construction. We test for architects, railways, engineers, and practically all branches of work.

846. Do you give advice as to resistance of metals?—No, that is for the metallurgists. If a man brought metals to me I could give advice as to the physical

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properties, but we do not take upon ourselves to advise on the metallurgical side. I am in touch with men I can call in to advise in that way.

847. Would you advise as to shock-resisting metals?—Yes.

848. Supposing I sent you a piece of metal, would you say whether that was a good shock-resisting metal?—I would put it under my tests. But at present I have not satisfied myself which are the best methods for determining resistance to shock.

849. (*Mr. Chalmers.*) As regards commercial or routine testing, your opinion is that generally speaking it should not be undertaken by a Government Laboratory or the National Physical Laboratory?—That is broadly my view.

850. And your chief objection to it is that as a man of science you regard such occupation of the National Physical Laboratory as being rather derogatory?—*Infra dig.*, I think.

851. I think you have spoken of your always having been a friend to the National Physical Laboratory?—Yes, I want to keep that feeling as long as I can.

852. You remember ten years ago the idea of starting it?—I was in favour of the idea of starting it.

853. Do you remember the lines on which it was then advocated to be started in 1897? Might I remind you of them? The general line taken was this. There were certain types of physical investigation too laborious and lengthy to be undertaken by individuals?—Yes.

854. On the other hand there were matters closely connected with the advancement of knowledge and with research, for instance, the investigation of slow changes in the properties of matter?—Yes.

855. Testing and verification, not only of samples, but of instruments, useful alike to industry and research?—Yes.

856. A third thing was what is carried out in the Reichsanstalt, namely, the systematic investigation of the physical properties of various bodies, which would hereafter be data of the greatest importance both for science and industry?—Yes.

857. Those were the lines, you may take it from me?—Yes, that was my feeling of the general gist, and I considered, and still consider, it is what we want in this country. There is a vast amount of careful investigation wanted.

858. This institution was to be, in fact, a pioneer of scientific and mechanical work, but a pioneer essentially?—Yes.

859. That is what you were in favour of in 1897?—Yes.

860. Then the proposition for an institution on those lines was considered by a Committee which reported in 1898 in favour of such an institution, and expressly excluded commercial testing work of the character that is carried on by private people?—Yes.

861. You saw no objection in 1897 or 1898 to what was being undertaken?—No.

862. And you remain in exactly the same position?—I am in the same position. The broad question is simply whether it is quite moral for them to take the commercial side. I do not think they were originally intended to take it, as I understand the reading of the charter. I think they rather seem to have drifted into it, and I hope personally it can now be stopped or at least kept within bounds.

863. And you regard their departing from what you understood to be the meaning of the 1898 Committee's Report to be derogatory to the real importance of the institution, its scientific prestige, and general national repute. Have I rightly understood what you have put forward?—I certainly think it has that tendency. It will lower it in people's estimation.

864. As regards your being protected, the boot is on the other leg, is it not?—I do not like the word "protection." We have lived hitherto without it. I think you have got my point of view.

865. (*Sir Andrew Noble.*) As regards Krupp, I happen to know a little of their establishment. They have a very good system of testing, have they not, although, of course, they do go to the Reichsanstalt?—May I say that for a great many years we had the honour of testing a great deal of work for Krupp. Herr Krupp came to my father within the first two years of his starting and he kept him busy for 32 years. Practically, he kept my father's head above water. For many years after, perhaps 30 years, we continued to work for him so. We have always had a very friendly and high regard for the firm of Krupp.

866. But they have some very complete testing as well?—Yes; I was invited over on at least two visits to see what they were doing; they have a very fine equipment.

867. I think there are three testers in London, are there not, who test material?—There are Sir Alexander Kennedy's successors, Messrs. Burstall and Monkhouse, and Mr. Stanger.

868 Would you have any difficulty, do you think, in agreeing with them as to the costs of certain ordinary tests, such as, for example, merely breaking an elongation? There would be a different price, I suppose, if elastic limit were required, and one or two other points, but would you have any difficulty in arriving at a basis of cost that might be considered to apply all round?—I think that could be arrived at, if there was a reason for it. I do not say that I would go to Mr. Monkhouse and suggest that his fees should agree with mine, but if a question arose as to what was the general level of fees I think we could arrange it. I have not found them undercut me, and I have never clashed with any of their clients. I have never canvassed for work. I do not know what Mr. Stanger's fees are either, but personally I do not think there would be any difficulty about his being approached regarding them, if they were required. If I were asked officially, I would help in any way I could.

869. (*Sir John Wolfe-Barry.*) To arrive at some sort of standard?—Yes. I would answer any *bona fide* enquiry as to what the fees were. I have never published a price-list. There are tabulated fees, and we answer when there is an enquiry.

870. (*Chairman.*) We have been informed that it would be unprofessional to issue a price-list?—Oh, yes. I have never done that. The nearest we have gone (and I think that is quite professional) was to issue a list of the materials that could be tested, but never any prices, and we have not touted for work. I do not think any engineer can say I have asked to do his work. We wait till we are approached, and then of course we are very glad to do what is put in our way. I might put it in this way, that if the question should arise there would be no secrecy on my part about my fees. I would not disclose them, perhaps, to a man in trade if I thought it was not *bona fide*, that he never meant to give me any work. I might say, perhaps, "Give me a definite letter and I will answer you."

871. But if the authorities of the Laboratory desired to know what were the ordinary fees, in order to avoid charging less than these, you would have no objection to disclose your fees?—No. I would disclose my fees. I should consider that a distinctly *bona fide* case. You see the fees vary with the amount of work and the kind of metal. We have hundreds of different tests in our place, so that we really could not keep a price-list if we wanted to.

872. (*Mr. Chalmers.*) Arising out of that last answer of yours, in connection with such Government work as a Government department might see fit to give to the Laboratory, work of the ordinary routine character, you would feel that the price there in such instances should be carefully fixed on the lines of the fees charged by outside practitioners?—I think so, otherwise it would tend naturally to the Government department going always to the National Physical Laboratory. I have had a very wide connection in testing, say for the Board of Trade, and I should not like their work to go past me simply because I could not look at the fees. It would be rather hard, I think.

873. If the India Office work, for instance, goes to the National Physical Laboratory, it ought not to go at a less price than the ordinary?—That lessens the objection certainly; but you know my contention that it is not moral that they should do commercial work at all.

874. (*Sir John Wolfe-Barry.*) That is on principle?—On principle.

875. But I was going to ask you whether you happen to know what I have been told, and that is that the India Office have always paid Cooper's Hill the ordinary prices for all tests?—Personally I was not aware of that.

876. I believe that is the fact?—I am glad to hear it. It is a very wholesome thing.

877. They have always paid it, and that has been really a great help to Cooper's Hill.—With regard to Cooper's Hill we never took exception, though we originally had the work. The work came originally to my father, it was afterwards sent to University College (without any mistake having been made by us), later to Messrs. Borstall and Monkhouse, and subsequently to Cooper's Hill. I thought we had not a ground to argue with Government about those changes; it was State Railway work, and they had a right to get those tests done by Cooper's Hill College or where they wished. I did not see we had any solid ground to argue upon. Of course, the whole subject is difficult.

878. But any lowering of fees you would object to?—Yes, that would be unfair, because it would be simply squeezing the private man out. Human nature is such that they would go to the cheapest people.

879. Is your work increasing?—It has been increasing, I must say, for ten years. It has had its fluctuations.

880. Up to the present time I suppose the National Physical Laboratory has had no effect upon you?—A very slight effect. I have not come here to grumble at the amount they have taken from me so far. It is more the principle, and, looking ahead at what effect it may have in five or ten years' time, that they might squeeze me out.

881. Then I suppose the locality of the National Physical Laboratory will always be somewhat against it in connection with engineers' offices?—For commercial work, yes. I think it is a fine site for what they had in view, their legitimate work.

882. When you are testing for consulting engineers in London, it is very much against them to have to go all the way down to Teddington, is it not?—Yes.

883. Therefore there would be a great tendency, I suppose, to keep that sort of work in London?—I think so, where we can do it very quickly.

884. And where the man can visit your testing establishment, and see the results from day to day?—Yes, and see the tests done, if you like. We have made a point of that in our place; I do not know whether it is unique, but we welcome people to come in and see our tests. We try to do good service to engineers in that way. I think it turns on the broad principle more, the principle of morality, whether commercial work was intended, and whether if commercial work were thought desirable it would tend to keep up the prestige. Personally, as a tester, I think not. I think it would be rather unfortunate; they would not have quite the standing that they would with the research work. There I think they have a grand field, and with careful work they would reach a very high standard.

885. But these are two very distinct questions, are not they? One is the damage to a private gentleman who has embarked his capital, and then there is the question of what is best for the National Physical Laboratory from the point of view of research?—Yes. I was speaking just now as an experimenter. I have tried to keep the points separate.

886. Do you really think, if the fees are kept considerably higher at the National Physical Laboratory, and in view of the fact that the work is done at Teddington and not at an over-convenient place, that there is any real serious risk to your own prosperity from the National Physical Laboratory?—It is very difficult to say how it would affect us. Some men would pay extra fees to get a government certificate.

887. At any rate, you would not give a positive opinion upon that?—It is very difficult to say how it would be with the higher fees. But, of course, whatever commercial work they do there is less for other people. It might not be a serious competition for me, it might not mean ruin to me, but I would prefer to take the broad view of principle. I sink my own private pecuniary feeling. The question, for argument's sake, is whether they could make enough money to justify the thing, to put it on the lower ground. Before you came into the room I was explaining the difficulties I find personally as a tester to do the two classes of work, and I think the same would hold good with them. It means practically duplicating the apparatus, and to a certain extent increasing number of staff, but certainly you would want to get separate apparatus to attend to the commercial work, which must be done in a hurry. If you have only the one set of apparatus, it interferes with research work most terribly to have to stop in the middle to do some wretched commercial test.

888. That is a matter of organisation, and the power of the purse?—The power of the purse. But I was trying to show it wants a good deal of consideration whether you could earn enough fees to make that pay.

889. To make the commercial work pay?—Yes; if you fix a high fee, higher than the private man would charge, will you get sufficient people to go to the National Physical Laboratory to give a sufficient reward for the extra expenditure? Then if they charge lower fees so as to get a greater quantity of work you are injuring the private people, and you are tending to lower the prestige.

890. (*Chairman.*) But if the higher fees were charged, the amount of pecuniary profit to the Laboratory might be small, or even nothing, and yet they might gain experience?—There is that point, but personally I do not think they need the commercial experience for good research work. I would be very glad to do without my commercial experience, I think.

891. (*Mr. Chalmers.*) Can you point, as a matter of experience, to commercial work having been of marked utility to those who have succeeded in research work? Is it a fact that research has as a rule been conducted by men whose time is taken up with commercial work?—No; I think I might almost say the other way, that the man who is trained commercially is not so likely to shine in research work.

892. (*Sir John Wolfe-Barry.*) But is it not rather difficult to say what is meant by research work?—Yes. There again they interweave very much. I should not myself consider that the staff need the routine work for the sake of doing their research work better. If I thought that, I think I might say we must put up with it for the general good, but I do not think it is necessary. I think myself they can do research work without knowing much about the commercial side.

893. (*Chairman.*) You are no doubt aware that that is a point upon which the authorities of the Laboratory do in fact lay great stress, the experience acquired by having a certain amount of routine work?—Do they say that?

894. (*Mr. Chalmers.*) You do not agree with them if that is their view?—No, my view is rather the other way. Perhaps I might put it this way, as to what the commercial experience tends to be, and perhaps that might help you. It is a very unpleasant subject, but what I have to guard against is this: I have to do my test accurately first, but I have to go further. I have to be a sort of detective, to see that the manufacturer or contractor does not play any tricks, and that is where a great deal of my worry comes in. I have to see that the samples which come in are *bona fide* samples, and I must be plucky enough to be able to put my foot down if there is any doctoring or any irregularity of that kind. That is the kind of experience you get commercially. The commercial tester has to have the experience of the research tester, but he has to go further in these rather unpleasant duties, in keeping his eyes open. I would personally rather do research work, because I do not care for these wrangles very much; I would like to work quietly. The research worker need not know so much about the tricks of the steel maker and others, and they are fearful. I thought, many years ago, I knew all the dodges, but I am constantly learning more, and have continually to battle against them.

895. (*Sir John Wolfe-Barry.*) That is research?—That is research, but it is very unpleasant, because, naturally, when I put my foot down and tell the engineer, the manufacturer puts his knife into me. So, from that point of view, I do not think the class of experience we get, by commercial work, would help a man. All experience is useful to a man, but I do not think it would help him to do purely research work better. Of course, if he had to test routine work and pass it, he would have to know these dodges, in order to be able to check anything and to keep his reports correct. It is a very difficult point; it is all interwoven.

896. Apart from the volume of business which is going on in London, do you think that the tendency to experiment and test is increasing?—I think there is no doubt it must be.

897. You think the tendency among engineers is all in that direction?—Certainly, and that, I think, is the explanation why I am able to live. Some years ago,

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when the colleges started engineering laboratories, unfortunately, they got into the rut that they would do commercial work, and I have had to contend with that competition. I have stood that competition, although, personally, I have thought it rather hard.

898. What colleges compete with you?—Leeds, Birmingham, Manchester, and, generally speaking, all of them.

899. Does University College still do commercial testing?—Yes, so far as I am aware.

900. Do the City and Guilds do it?—They do, I believe.

901. Do they do it for outsiders?—I cannot say that from personal experience. But Leeds, the East London College, and others do. Still, I have never publicly complained. But I am only anxious now in case the National Physical Laboratory comes in, because they have such a prestige in the name alone. Being a Government Department gives them a great leverage to begin with. We were able to hold our own against the colleges. But if the work had not increased very largely I could not have held on, because for at least ten years after the colleges began doing this it was very uphill work.

902. (*Chairman.*) The college competition has been very serious to you?—Yes; and it has meant cutting our fees to the lowest point.

903. And if the competition of the National Physical Laboratory was added, what would you say?—That is the reason I am giving evidence here. But I want rather to sink the personal side, and to look on it as a question of what is the best in principle.

904. (*Sir John Wolfe-Barry.*) Do you know if the colleges charge the same fees as you?—They do not. In fact we have had our clients approached, and told "If you come to us, we will do it for so much less." That is very galling.

905. (*Chairman.*) Did they issue price lists?—No, I do not think they went so far as that.

906. (*Sir Andrew Noble.*) They cannot have your experience?—There are a number of very able men there. I should not mind so much if I thought the head man was making the experiments, but I think in very many cases the classes of students have done the experiments, and that is very sore on me, because if mistakes are made (and mistakes are made at schools), I have had a man say to me: "Oh, bother the testing! Testing is all humbug! I had a lot of beautiful stuff condemned. The students made a mistake." I said: "You must not blame me for that." I think, if the testing is conscientiously done, I have not quite so much reason to complain. You want trained men in testing. I object on principle to colleges undertaking outside or commercial work. There is one point which perhaps I ought to mention why we should not grumble so much. Those colleges have been doing useful work training our future engineers, therefore we ought to put up with something for that. The students have the benefit; they have the handling of these machines.

907. (*Sir John Wolfe-Barry.*) They are bringing up people who know the value of testing?—Yes, and I am beginning to feel the benefit of it. There is more demand now for testing. An engineer comes along and says, We do not know this, and we do not know that, and he wants to get the information; and that is where there will be more and more work, I think, cut out for the National Physical Laboratory in research. There will be a vast amount of work to be done.

908. That is another question, the research. I was talking more of routine testing?—Routine testing is more wanted.

909. Everybody recognises it as a necessity more and more?—Yes.

SIXTH DAY.

Tuesday, 14*th May*, 1907.

PRESENT:

The Right Hon. GERALD W. BALFOUR (*Chairman*).

Sir JOHN WOLFE-BARRY, K.C.B.

Mr. ROBERT CHALMERS, C.B.

Mr. G. C. UPCOTT, (*Secretary*).

Mr. JOHN EDWARD STEAD, F.R.S., called and examined.

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910. (*Chairman.*) You are by profession a metallurgical chemist?—I am.

911. Practising in Middlesbrough-on-Tees?—That is so.

912. Would you kindly state to the Committee the general nature of your experience?—I have been practising in connection with the testing of materials, copper, iron, and steel, for about 34 years.

913. And have you done work as a public analyst?—That is one part of my duty.

914. During the greater part of that time?—Yes; for 31 years.

915. You are a Fellow of the Royal Society, the Institute of Chemistry, the Society of Public Analysts, a member of the Iron and Steel Institute, an Associate member of the Institute of Mechanical Engineers, also an honorary member of the Institute of American Mining Engineers?—Yes.

916. A Member of the Council of the Iron and Steel Institute, and of the Institute of Chemistry?—Yes.

917. It is not, however, on behalf of those bodies that you are giving evidence to-day?—No; the qualifications given are justification for my evidence.

918. Quite so. Would you describe to us the class of work that you have done professionally?—Yes. Mainly my work has been the testing of minerals and metals.

919. (*Sir John Wolfe-Barry.*) Chemical analyses?—Yes, chemical and also mechanical; also reporting on the mechanical properties and structures of metals and alloys.

920. (*Chairman.*) You have not undertaken any tensile tests?—I take the tensile test in conjunction with research work when I am asked to make a complete report. I have not any testing machines of my own, but I am surrounded by them, and go down to the machines and have the testing done in my presence.

921. And you are thoroughly conversant with all the methods of testing the mechanical properties of metals and alloys?—I am.

922. Do you desire to pass any criticism upon the work done by the National Physical Laboratory in connection with the testing of materials?—You mean

by criticism what I have to say about the scope of the work they do?

923. Yes?—The only thing is that I think the Laboratory was instituted for the purpose of testing the properties of materials, but not of individual samples, that is to say, to make original researches on the properties of material and also for the purpose of standardising apparatus such as pyrometers and other standards.

924. But you consider that so far as regards the testing of materials it was not intended that the National Physical Laboratory should undertake any ordinary commercial work?—That is so. In fact, I might say that had it been hinted that such was the intention, the Laboratory would certainly have not had any existence to-day.

925. Would you concur generally in the recommendation of the Committee which reported, in 1898, to the Treasury?—What was that report?

926. That is the report on which the National Physical Laboratory was founded?—Yes; I have read that.

927. You concur generally with the terms of that report?—Yes; I agree to that. It is practically in agreement with what I have already said.

928. I think it does not go quite so far as you do in this précis. For instance, I understand that your view is that no research work should be undertaken by the Laboratory at private expense for the benefit of individuals or industrial firms?—That is so, unless the results are published. I might qualify that to a certain extent in this respect—I think that private firms who have mysteries which require thoroughly solving, and which it would be of national importance to be solved, might hand that work to the National Physical Laboratory for thorough investigation; but the results, although of course handed to those private firms, should be published for the public benefit.

929. Would you make the question, whether or not the information obtained should be published, the test of the question, whether such work should be undertaken at all?—I say that ordinary commercial testing, such as any existing private firms undertake, should not be done by the National Physical Laboratory. I consider that such work is degrading for an Institution of that kind.

930. In paragraph 24 of the Committee's Report, there is a passage to which I should like to call your attention. "The result of investigations undertaken at the request of private individuals should, except in special cases to be approved beforehand by the governing body, be published or be accessible to the public, even when the cost of the investigations is fully defrayed by the persons in question." That question seems to show that the Committee had in their minds the possibility of cases in which the cost of investigation should be wholly defrayed by private individuals, and in which the results should not be published?—Yes, there might be exceptional cases.

931. Would you admit such exceptional cases?—Well, I should like to know what the cases were. If a specific case could be given, I should, perhaps, be able to judge It is rather difficult to say off-hand where I would or would not agree to that.

932. To that extent, then, you would be prepared to modify the statement in your précis that no research work should be undertaken at private expense for the benefit of individuals or industrial firms?—That is private work which is not published, I understand you to mean by that question. Purely private work, is work which is not to be published, I understand?

933. Yes?—I think it was not intended that work should be really done in the Laboratory solely for the benefit of private individuals. I think it ought to be published *except in very rare cases.*

934. Then you do not agree with the implication contained in the passage I have read to you out of the Report?—It would have to be a very exceptional case before I could agree. In general terms I should disagree to keeping private the work done for individual firms or persons.

935. What do you say to the argument which is often used, that in order to carry out their research work effectively the staff of the Laboratory require that kind of experience which they can obtain from commercial work, and perhaps obtain only from commercial work?—That is to say in order to qualify themselves for the purpose of doing research work.

936. In order to keep their hand in?—Oh, no; I think I would rather put it the other way.

937. It is said that in order to obtain and maintain the necessary experience a certain amount of commercial work should be done. Do you hold that view?—I hold that a certain amount of work should be done, but not necessarily commercial work. For instance, before I, in my own business, ever thought of taking commercial work, I should prosecute research work until I was perfectly certain I could do that work, but I would never think of taking commercial work that I was not qualified to do. Your question implies that in order to justify them in doing research work they are obliged to qualify themselves by doing commercial work. I say not at all.

938. I am only quoting an argument, and asking your opinion on the subject?—I understand. That is my position. I say it is not at all necessary to do commercial work to qualify them to do research work.

939. You think that the research work alone would be sufficient to give them the experience they require in carrying out the research work?—Exactly, and further more I might say this, that if their work was confined to research work, and research work sometimes of a very special nature, if they did not take commercial work they would have the co-operation and assistance of every expert in the country, who would very gladly communicate to them the best methods of doing the research work they were employed upon, which at the present time they do not feel inclined to do.

940. But have the Laboratory invited their co-operation and found they were unwilling to give it?—I do not say that they have. If the Laboratory sought the assistance of private testing firms to enable it to compete for ordinary commercial work, it is scarcely likely they would give it with any degree of pleasure. From the very first I have always offered every assistance that I could to the Laboratory, and have given material assistance to it. I might say that I am not antagonistic to the National Physical Laboratory. I think it is a most important institution.

941. I quite understand that. I was not suggesting for a moment that you were. Do you consider it would be legitimate for the Laboratory to undertake work offered to it by a Government department?—Provided it could be proved that the work were better and cheaper done by the Laboratory; I do not know that I could put it in any other way than that. But the probability is that it would cost the country more to do such private work in the National Physical Laboratory than it would cost if it were done by private firms, and it would not be done better.

942. But you would not go the length of contending that the Laboratory, in undertaking such work, was interfering with the work of other agencies illegitimately?—Not if the work had not been done by other agencies previously. That is obvious.

943. Take the case of Cooper's Hill, for instance. If the work done at Cooper's Hill was all transferred to the National Physical Laboratory should you say that that was an illegitimate interference with the work of other agencies?—That would be a question as to what you define by the word "illegitimate." If other agencies had not been doing it, of course it could not possibly interfere with them.

944. I am rather pressing the words "illegitimate interference," because one of the complaints, as I understand it, that you make is that the work which the Laboratory at present undertakes does involve an illegitimate interference with the work of other agencies?—Of course in making use of that expression I was referring to work which had been done, and done efficiently, by other agencies.

945. And I ask you whether you would extend that view to the case of work tranferred from Cooper's Hill to the National Physical Laboratory?—It could not interfere with other agencies, except the agency which has been instituted since Cooper's Hill has been closed. I do not know who is doing the work. I think Mr. Harbord is doing most of it at the present time, and it would certainly interfere with the work he has been doing since he left Cooper's Hill.

946. Should you object to the National Physical Laboratory being made arbitrator in cases of dispute between private firms, or a private firm and the Government, in the matter of the testing of materials?—Accepting the position that the National Physical Laboratory were infallible, yes. Otherwise, no; because I do not think

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the work that they would do would be sufficiently advanced as to justify them in saying that it was superior to what could be obtained by experts in ordinary practice.

947. But if by consent of the parties to the dispute the National Physical Laboratory was called in as arbiter, do you think that that would be an improper work for the Laboratory to undertake?—I think that would be interfering more or less with the work of private firms. You see, private firms at present are called in to arbitrate in those matters, and it would certainly take the work from them.

948. But do you consider it would take it illegitimately or improperly from them?—Yes, I do.

949. That is what I wanted to get. As regards the lines of any further development in the business of the National Physical Laboratory, would you like to make any observations?—I naturally anticipated that when the Laboratory was formed, it would commence at once to do very important research work which was impossible to be done thoroughly and properly by private individuals. It is a class of work that I have in my own small way been trying to prosecute for a great many years. In fact, if the Laboratory were to undertake this work (which by the way I am not paid for in my ordinary business), I should be very glad to be relieved of it entirely, if the Laboratory were placed on a proper basis; and would be glad to lay my experience before the Laboratory experts. If the work of the Laboratory was confined to such lines, they would, I believe, have the co-operation and assistance of every expert in the country, who would be very glad to give an opinion and help them in such research work, because it would be for national benefit.

950. Those are the lines already laid down in the Report of the Committee of 1898?—Yes. Unfortunately, however, they have devoted their attention apparently more in the direction of commercial testing than research work. I might say, in taking ordinary commercial work, in my opinion it must interfere very much with the prosecution of research work. In my own little way I know I find it very galling to have to leave important and soul-absorbing research in order to test commercial work and give my attention to other things. I find it is very difficult indeed, and for that reason, although I love it, I should be very glad to throw this research which I am doing to the National Physical Laboratory for completion. By that work, I refer to the causes which lead to the fracture of steel rails and other materials of that kind. I have been trying to do, practically, what the National Physical Laboratory ought to have done, that is to say, I have been getting in touch with both railway and other engineers, and soliciting that any fracture, any peculiarity, any mystery that they cannot solve I should be allowed, simply for the matter of the love of it, to follow up and try to get to the bottom of it. Of course, that has given me a very great deal of experience, and has cost me a very considerable amount, and I find I cannot do it thoroughly. But the National Physical Laboratory, if it were to follow on the same lines as I have adopted, would do an enormously valuable national work.

951. You do not suggest, however, that the Laboratory has not, as a matter of fact, been spending time on work of that description?—Mainly in connection with the reports to the Mechanical Engineers. Of course they have done some very important work. They have justified their position by that.

952. The actual amount of the work to which you object, hitherto done by the Laboratory, is very small?—I do not know how much. This is a question of general policy we are discussing.

953. I may say, as a matter of fact, it has been extremely small?—Yes, it is very small. I will take it from you it is so.

954. In so far as funds were required for prosecuting the work of the Laboratory of which you approve, and such funds were not forthcoming from other sources, your view would be that they should be supplied by the Government?—Certainly. I consider the work, such as the Laboratory ought to do, is sufficiently important from a national point of view, to justify it.

955. *(Mr. Chalmers.)* What the Chairman suggested to you was that the amount which they get from fees is at the moment very small, so that you have a very minute amount of ground to give up according to the lines you have first mentioned. It is about £111, I think, according to the last figure. You do not propose on the basis of £111 to start any crusade, do you, for obtaining many thousands from the Exchequer?—I mean to say what is required shall be supplied. I do not mind what it is. I think the matter is sufficiently important, and I say that the Treasury ought to look at it in that light.

956. *(Sir John Wolfe-Barry.)* Are you acquainted with the German institutions which are more or less analogous to the National Physical Laboratory?—No, I am not personally acquainted with them. At least I know that the work they do is very largely published for the public benefit. I have a great many reports from the Charlottenburg Laboratory.

957. But I mean as to the nature of the work which they undertake?—No, I do not know the scope of it.

958. Then I was going to ask about the publication. Would you think the publication should be the rule and not the exception?—I think that publication ought to be the rule and not the exception.

959. But that under certain conditions there might be exceptions?—There might be exceptions.

960. Those exceptions up to now, if there are any, or in the future if any occur, would be exceptions authorised by the Managing Committee, I take it, of the National Physical Laboratory?—Yes. They must be of a very exceptional character to admit of that.

961. Would you be content to leave the exceptions in the hands of a body which is so representative as the Committee of the National Physical Laboratory?—Not fully. I should like to prescribe within certain limits what they ought and what they ought not to publish.

962. Then would you rather prescribe it yourself than leave it to the Committee?—You see, to leave it to the Committee, if the Committee felt in one particular way they might say, "Well, let us make it the exception to publish and the reverse to keep close."

963. But the rule being that publication is the ordinary course and non-publication the exception, somebody must say who is to make the exception?—Exactly, but take a case. It is rather difficult to argue this point without a specific case. Suppose the Government were to say, "Now we want to make a particular search upon a particular kind of material for a particular purpose."

964. We will say for artillery or something of that sort?—Artillery, and it is most important that we should know this and nobody else should know it. In that case I should say they would be perfectly justified in keeping it dark.

965. I quite see there ought to be exceptions, but my question is, who is to be the judge of such exceptions? If you do not put it in the hands of the National Physical Laboratory Committee, what other Committee could be suggested which would be more representative than they are?—That of course is a difficult question. That is rather a poser. It would be difficult to appoint any other Committee to decide. This Committee I should say ought to be able to specify the boundary beyond which they ought not to go.

966. You are acquainted with the constitution of the Executive Committee of the Laboratory, are not you? It is a very representative body?—So far as that is concerned, I think that if anything they scarcely represent as fully as they ought the manufacturing side, and the country. At least they do not as far as their attendance is concerned. I think we have not got any manufacturers and people from the country on the Executive Committee. On the general Committee there are.

967. My impression is there are?—I may be wrong, but my impression was that the reverse is the case.

968. Mr. Hadfield is a manufacturer?—Yes. Is he on the Executive?

969. Yes. Sir Andrew Noble?—Yes.

970. Colonel Crompton?—Yes. Out of how many?

971. Mr. Gray, the cable manufacturer. That is four manufacturers I have given you out of 17?—Yes. Of course that Committee I think might include more people from the country generally. With the exception of Mr. Hadfield they are all from London. It is really, I suppose, almost imperative that one ought to have men from town, because it is generally so difficult to get them from the country to attend the Committee meetings.

972. Of course the general Board has got a larger number than 17?—Yes, but I understand the general Board are rather not in the position of doing anything.

973. I suppose we ought to talk about the Executive Committee?—Yes, we must, I think.

974. I take it your two objections to the National Physical Laboratory doing what is called commercial work are first of all the interference with private agencies, and secondly, you think it would interfere with the research work?—Yes, I think so.

Note added by Witness.

It must be clearly understood that, in referring to work done by the Laboratory, it is meant such testing as cannot be efficiently done by private agencies. The Witness maintains that ordinary commercial testing should not be done in the National Physical Laboratory.

The Right Hon. RICHARD BURDON HALDANE, K.C., M.P., called and examined.

975. (*Chairman.*) You were good enough to express your readiness to give evidence before this Committee, but you have not submitted any *précis*, and as I do not know the points on which you wish to lay special emphasis, perhaps the best way will be to leave you to make your own statement in your own way?—Very well. I have given a good deal of attention to the general question that there is here, and I come in contact a good deal with the opposition that there has been to the plan. I have also seen, not the working of the Reichsanstalt, which I know only at second hand, but the great private establishment of an analogous nature, the Centralstelle, in Berlin. That is the creation of what is called the powder group there, which is a group of the various great powder manufacturers who found that it was unsatisfactory to send their things up for tests by private chemists, and the same thing applies to the steel which I will come to in a moment. The reason is this (and I think it is a reason that is particularly apposite to what we have to deal with) that however good a private chemist may be, there is a class of test which requires experiment and observation on a very much larger scale as regards apparatus and with a very much larger staff than he can command. Even the best of them cannot overtake certain parts of the work. In steel of course that is notorious. You know the great tension apparatus that they have now at Teddington; the one that was built by that firm in Leeds—I have forgotten the name—who also made a similar one for the Paris Exhibition. No private firm could command such an apparatus. At Neubabelsburg, Krupp and the various private manufacturers who are interested in steel have arranged for the provision of those things. I think the original cost of the various sorts of apparatus they have there was about £100,000, but that is several years ago and it has grown very much since. In the same way with their researches into powders, and in powders is included not only powders for military use, but every kind of explosive for industrial work. These are tested with apparatus on a scale such as no private firm could have; the most elaborate cooling apparatus with frozen air, the most elaborate structures for obviating the consequences of explosions, the most elaborate apparatus of every kind, for heat test, for stability test, for determining calometric results when you either explode or burn slowly—all those things are beyond the means of private firms. The nearest I have seen is in the Elswick works, where Sir Andrew Noble tells me they spent about £100,000 in one way or another in experiments of various kinds. I suppose he means in ship construction and so on as well, but they certainly spent a lot of money in apparatus. But even that is on a small scale compared with what there is at Neubabelsburg. It is true that at Teddington it is probably a more general class of work that is done, but the same thing comes in year by year; the apparatus on the scale necessary for making these tests, on the only scale that is at all useful, is getting more and more great, and I myself feel that while there is a great field open, and will always be open, for the private experimenter who is ready to test a sample or to do ordinary work, there is an enormous volume of work which not only will be done in the future, but ought to be done now, and we are very much behind in not having it done. In America, in France, and particularly in Germany, between the Reichsanstalt and a great private testing place like this, the work is systematically done for the merchants, and I think they are anxious for it to be done here, as far as I can make out.

976. You say you have come in contact with those who take objection to the present practice of the National Physical Laboratory. I suppose nobody would object to the Laboratory carrying on experiments which are beyond the scope of any private establishment by reason of their not having the necessary apparatus for the purpose. The dispute has arisen almost exclusively, if not exclusively, in connection with testing work which is and can be carried on at private establishments?—I think the comment upon that is that a very large number of people feel, and feel reasonably, that you cannot separate the one from the other, that where you have got a great establishment like this you have testing work done upon a different scale. And more than that, there is a point that comes up in connection with my office. We have disputes with contractors about the quality of the stuff that has been furnished to us. I do not think one or the other of us would care much about the opinion of half-a-dozen of the private chemists whom I could mention who do this work to a very large extent, but we attach very great importance to it when it is done by a highly organised semi-Government Department, such as the National Physical Laboratory at Teddington is. It is not only the superiority in apparatus which makes it a more valuable institution for the minor work, but it is the authoritative character.

977. (*Mr. Chalmers.*) Have you, as a matter of fact, gone to them?—To Teddington?

978. Yes?—Oh yes.

979. I am speaking of the Secretary of State for War. Has the Secretary of State for War gone to them as a matter of appeal?—I cannot tell you, at this moment, whether it has actually been done, but we have suggested it once or twice, and it might probably be interesting to the Committee if I ascertained whether we have actually gone to them. I will just take a note of that and ask the proper Department to find out. I doubt very much whether it has actually come to that, but we have two or three times said, "Well, this is our view; we do not insist on it as a mere view that we take as of right, but if you like to refer it there, well and good," and we consider the National Physical Laboratory a resource, in case of need, against the Contractor.

980. (*Chairman.*) Do you think the National Physical Laboratory is in a position to act usefully as arbitrator in cases of dispute?—That is it.

981. (*Mr. Chalmers.*) Whether it is in the contract or not?—I do not think we have ever put it into the contract.

982. Take it the other way round. Suppose the contractor did not like your chemist, and insisted on going to the National Physical Laboratory, though it was not in the covenant?—I should certainly, if it came before me, send it there, but whether we have actually done it I will just find out. It has been discussed often enough.

983. Suppose the question was that you should pay extra on some things and your chemist said you ought not to pay extra. The other man said on the other side, "I have a chemist to be paid extra" would you, though it was not in the covenant, insist in the interests of science in sending it to Teddington in order to pay more?—I am going to give you a case that has happened to me once a fortnight for the last six months. Suppose in the contract it is said, you are to provide us with materials of such and such quality and you are to do such and such work, nothing said about the arbitrator. The case goes to a Court of Law unless one can settle it. There is another form of contract which I think is equally objectionable, which says that the Secretary of State is to determine what allowance is to be made. That makes me judge and advocate in my own case, which of course is very absurd. What I have done lately is this: I have found masses of litigation, and litigation which has been going on some of it for years in my office, which one was unable to withhold from the decision of the ordinary tribunals, because there was no particular person to go to.

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Now I settle them all by asking the President of the Surveyors' Institute, or the President of one of our great engineering institutions, to name a single arbitrator, and, being a person of great experience in these matters, I say he is to have no counsel, and no solicitors, and no skilled witnesses before him, unless he chooses to call for them as necessary, which I hope he will not do. I have found they are willing to assent to that, because of the authoritative character of the person they get. The case you put of an open contract, I might have to go to law about.

984. If it were an open contract; but I think you have mentioned what I believe is a more usual form of contract, that you yourself being above the office altogether are the actual arbitrator, and therefore there is no need to go outside?—Still they come to me and say, "Now you must settle it," and there is our chemist at Woolwich, an excellent person, who says so and so. But I say he is the very person whose judgment is arraigned, and if I cannot act upon it, I cannot act on my own. That is where a body like this comes in.

985. (*Chairman*). Where the decision is left to the Secretary of State, the Secretary of State might refer it to the National Physical Laboratory?—Yes.

986. Where no provision is made in the contract the National Physical Laboratory might still usefully discharge the function of arbitrator by common consent between both parties?—Yes. For instance, we have a case which is going on now which I should have liked very much to have sent there, and that is the question of the use, in the manufacture of cordite, of chloride of mercury. It has been introduced in small quantities, as the War Office said, in order to prevent the Abel heat stability test from being operative; as the other people say, in order to prevent decomposition, because it has a curious stabilising effect. I have got that, by arrangement with the Admiralty, referred to a very eminent committee for a report, on which Lord Rayleigh is sitting, and all the first people we can get. But it is a very clumsy business, and it has been also possible by the scandal it made by getting first into the Police Court and then on its way up to the High Court on appeal. But if it had originated at first with us I think we should have sent it to the National Physical Laboratory, and let them turn on their chemists to weigh the evidence, which is very voluminous.

987. Do you think that in any respect the Laboratory has gone beyond the limits that are desirable in the commercial testing of materials?—That I cannot say. Of course, when I said I had been brought in contact with complaints, what I meant was in my capacity as Member of Parliament. Various people have come to me about it and have said "Now here is a Laboratory which is subsidised by the State and consequently is able to deal with the work with less outlay, and it competes unduly with us." I think the Laboratory ought to charge for the ordinary work certainly not less than the market fee, and I am told that in the Reichsanstalt they do charge fully upon that footing. I do not think they have any complaints in Germany about the working of the Reichsanstalt. I was asking Sir Andrew Noble about it the other day, who had been inquiring, and he said he thought there were none.

988. I think there is much less work done by private enterprise there?—Yes, but Sir Andrew Noble tells me—it is *ex relatione*, but it is always interesting—that notwithstanding his very considerable means of making these tests he is getting more and more in the way of sending these things to the National Physical Laboratory instead of sending them outside, because the work, even of an ordinary kind, is done on a very different footing. But he quite agrees that the charges ought not to be such as to starve out private enterprise.

989. Do you think it would be desirable to lay down any regulations by which the Laboratory should be bound in respect of the undertaking of the work of testing materials?—There I come to a region that I have no experience to guide me about, but I should think there is some difficulty in that. My belief is that the fees of the private people vary a good deal; at least I know from my experience in patent cases when I was at the Bar that what used to be paid to the expert for giving skilled assistance varied very much with his standing, and what you have to pay Sir Henry Roscoe, for instance, if you call him in to make experiments for you and to go into the box, is a very different thing from what you have to pay to that regular very well-known chemist in Glasgow—his name slips me just now—but he used to appear at very much lower rates than the others; and I expect when you come to the tests they vary a good deal. Therefore it is difficult. It seems to me that the fee of the National Physical Laboratory should be in some way proportioned to the excellence of the work.

990. (*Sir John Wolfe-Barry.*) We have been told that there is no recognised scale of fees among those who do mechanical tests, which are the matters more particularly in dispute. It is not the chemical tests, because very little chemical work is done there. But we are told there is no recognised scale of fees?—I should think that would be so.

991. But it would be quite possible to discuss them with the National Physical Laboratory?—I should think that was so.

992. (*Chairman.*) On the whole you would be prepared to leave it to the Committee of the National Physical Laboratory to determine what tests should or should not be undertaken?—I think so. Otherwise I do not see that there is any object of standard to which you can refer. To my mind the institution of the National Physical Laboratory was a great step forword. I am sure we have only got to the beginning of the appreciation of its utility, and I do not see that from outside you can lay down any standards which will hamper it, beyond the general indication that it ought not to do work at starvation prices.

993. And ought to be careful to avoid interfering unduly with private enterprise?—That is it.

994. Those two general precepts you think would be sufficient to guide the Executive Committee, and the rest might be left to their discretion?—I think so. I think when you look upon them the complaints against the National Physical Laboratory are based upon sentimental rather than tangible grounds; because how you can compare the price that is paid for the opinion of one expert with the price paid to another seems to me an insoluble problem.

995. (*Mr. Chalmers.*) But in testing a sample in a very simple case like that tension or torsion, surely you can very readily compare the work? It is the same work?—You would say so, except that the National Physical Laboratory perhaps would bring to bear a very enormous and elaborate machine.

996. It has been urged that it is the other way round, and that the equipment and the personnel of the National Physical Laboratory would not compare favourably to-day with the very big outside firms who, in this country, though not in Germany, do carry on the testing of samples, and combine with it a certain amount of research work?—I think that depends entirely upon what the work is. Steel testing I should have thought (and there I speak with no adequate knowledge that entitles me to express an opinion) was a thing for which the National Physical Laboratory was better equipped than any private firm. It has a very elaborate and costly apparatus for steel testing.

997. (*Chairman.*) The amount of work they have done up to the present is something very small, but the equipment is improving, and they are just now erecting a 100-ton testing machine?—That is so.

998. (*Mr. Chalmers.*) Take steel. It has been given in evidence before us that there are a great many tricks in the steel trade, and unless you are in very constant and large practice, it is very difficult to keep abreast of the manufacturers' tricks. Consequently the utility of the National Physical Laboratory would depend entirely upon whether it had a very large practice, apart from its big machine?—On that point, but there is another set of problems which I think stand on a very different footing. When I sat on the Explosives Committee we had the whole question of gun steel before us for a couple of years, and among other things we had the question of the proportions of nickel and vanadium and other things and we had to feel our way. What we had to get were large limits of elasticity. Steel is more elastic if it is hard steel, but also if it is a hard steel it is a brittle steel. What we had to get was the utmost limit of elasticity compatible with the steel not being too brittle. That involved the most minute researches into the effect of the admixture of these substances in the proper proportions into the steel, and some exquisite work was done by Sir William Crookes, who was a member of our Committee, with photographic work upon the structure of the steel, magnifying it enormously. I do not think it is probable that at this time, even in the National Physical Laboratory, there was anybody who could have done that work so finely as Sir William Crookes, but then Sir William Crookes

is in an altogether exceptional position as compared with any other person to whom we could have gone. If it had not been for him we certainly would have gone to the very best talent we could get.

999. (*Chairman*). I do not think anybody has suggested that the National Physical Laboratory should not undertake investigations of that kind. With respect to that sort of investigation the only question is whether the results should be published or not?—Yes.

1000. What is your view of that. Supposing an investigation of a very difficult nature, such as could not be carried out in a private establishment, is undertaken at the request of a firm or individual, do you think publication should be obligatory?—No. I think you would discourage very much the use of the Laboratory for that reason. I do not think the gain would be in the least proportioned to what you would lose.

1001. (*Mr. Chalmers.*) What would you say in answer to this question?—I will read it. "The point therefore that I would raise is—whether it is within the legitimate province of the National Physical Laboratory to assist a Company or an individual with an industrial and commercial object in view, in the more exact ascertainment of the physical properties of certain materials, as to which fuller information is required than he can easily otherwise obtain. The question presupposes the defraying of all incidental expenses by the initiator of the enquiry, and the temporary reservation for private use of such of its results as may be deemed prejudicial to the initiators to immediately publish." The point is that the skill of the National Physical Laboratory should not become, even by purchase which would adequately cover the cost, the property of the person who contracts to get the benefit of the skill. It seems to me that question ought to be anwered that if anybody from the National Physical Laboratory or anybody else suggests a point and obtains an answer to it, that the information which he has got is his to make use of, and whether he can patent it or not depends upon whether he has been the inventor within the meaning of the Patent Acts, but that is the only restriction; the work has been done for him. If an expert in any other walk of life does a piece of confidential work for some person who pays him to do it, the result belongs to the person with whom he has contracted.

1002. (*The Chairman.*) Then the question of publication again is one which you would prefer to leave to the Executive Committee?—Yes; I think they ought not to publish when they have done a piece of confidential work.

1003. (*Sir John Wolfe-Barry.*) The question that is put there is reservation for a time, you will notice?—For a time, yes. I think you must have a limit of the time, just as you have a limit on the patent.

1004. The thing might be very interesting indeed, but it might be desirable to keep it secret for a time?—Yes.

1005. And after that time has expired it might become public property. That is what this gentleman put?—Yes. It is not like a patent, because the theory of a patent is that you cannot patent an idea. You can only patent an application of the idea, and you have done something for the benefit of the public when you have done that. But the real analogy I think is this, that if you consult an expert, and he contracts to furnish you with something for your own information, then, unless he guards himself in his contract, the information is yours. The Executive Committee of the National Physical Laboratory I think might well say, "This particular research which you are putting to us is one of such general scientific interest that we prefer not to undertake it unless the result may be made public." But if they do not do that, and if he comes to them perhaps with some problem the very definition of which involves great skill and ingenuity in itself, then I think he has purchased the answer and it is his.

1006. (*The Chairman.*) You go beyond the limits laid down in the Report of the Committee of 1898, because their view was that publication should be the rule and non-publication the exception. You, I think, put it that non-publication in such cases should be the rule and publication the exception?—I think it comes to this in my view. I am putting it on the analogy of the contract which a man makes who consults an expert.

1007. Do you happen to know what the practice of the German Reichsanstalt is in this connection?—No, I cannot say. Of course at the Centralstelle it is all private, for the good reason that it is not a public institution.

1008. Is there any other point you would like to put before us?—No. Really what I wish to say comes to this, put shortly, that I think there is a great deal of sentimental objection raised to this work which is founded upon a misapprehension, and I know no abstract rules by which you can guard against it. I should much prefer to rely on the good sense of the Executive Committee of the National Physical Laboratory to do the right thing, which is to observe certain principles, one of which is that they must not starve the private tester by undercutting him.

1009. (*Mr. Chalmers.*) What you assume your public tester must be interested in, is the extension of the bounds of human knowledge. That is the thing that you are expressly interested in, and it is to the advancement of knowledge that you particularly attach yourself in the matter. Are you aware of the objects of this Institute when it was started? May I just show them to you—just those three points?—I will read this out:—"The observation of natural phenomena, the study of which must be prolonged through periods of time longer than the average duration of life. The testing and verification of instruments for physical investigation and the preservation of standards of reference, and the symmetrically accurate determination of physical constants and the numerical data which may be useful either for scientific or industrial purposes." I will take the first.

1010. Taking them generally, those are things which tend to do work that private individuals cannot do for one reason or another, and that all people who are interested in the development of science must desire to see carried on, and carried on in this country. That would be your feeling?—Yes.

1011. And that would be the important thing, to extend human knowledge. You would feel that very strongly?—Yes.

1012. Would it be pressing you too much to say that you would regard the sample testing and that kind of thing as a very unimportant matter as compared with the extension of the bounds of human knowledge?—My answer is that I do not differentiate them. If public opinion in this country had got so far that it was thought desirable to keep up more pure research institutions than it does, then I should have said that these pure research institutions had better confine themselves to things that really were independent of the making of private tests, or at any rate, that the private tests should be mere incidents in the general work. But, as I take it, the object of the National Physical Laboratory is two-fold; first of all, to put an amount of expert knowledge, which has not hitherto been at the disposition of private industrial enterprise at the disposal of that private industrial enterprise, and secondly to create an establishment which will do very valuable work, which will as it were kill two birds with one stone, assist the inventor and at the same time extend knowledge, on the basis that a part at any rate of the cost of it is not furnished by the State but furnished by the people to whom it is useful.

1013. Is that in what you were good enough to read, do you think?—I think so; "the testing and verification of instruments for physical investigation and the preservation of standards for reference, and the symmetrically accurate determination of physical constants and of numerical data which may be useful either for scientific or industrial purposes."

1014. That is not of the sample order, is it. I am trying to get from you what you say on the side of the extension of human knowledge?—I see your point. You are suggesting, I think, that this is drawn more widely than mere testing.

1015. Drawn to the exclusion of mere testing, is the point which I was asking your opinion upon?—I do not think you could separate the two. No doubt, if the National Physical Laboratory were giving its time and its energies up to making a series of small commercial tests such as are constantly made by small people for industrial work, then it would be departing from the very broad view that there is here. But I have looked upon the National Physical Laboratory, rightly or wrongly, as an institution which has the two-fold object of extending knowledge and interesting the industrial public in rising to a higher level altogether in these things, and

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also getting contributions from them in exchange for work done.

1016. Sample testing ?—Yes, but sample testing of a kind which goes rather further and higher than the ordinary sample testing which is done by the mere professional man.

1017. *(The Chairman.)* Your difficulty is that sample testing passes by imperceptible degrees into something much higher ?—That is it.

1018. Into the kind of investigation which everybody admits ought to be undertaken by the Laboratory ?—Yes. I cannot separate one from the other. I have become convinced in the experiments I have had (and perhaps I had as much experience as an outside layman could have had in the four years I was working on the Explosives Committee) that the higher test work is scientific work, the purpose of which is the extension of human knowledge. Steel is one of the very best illustrations, the determination of how to increase the limits of elasticity of steel.

1019. (*Mr. Chalmers*). Yes, but testing a sample to see whether it comes up to specification surely is not a thing that you can compare with research work ?—In just that class of problem, you design a gun, for instance, everything looks right, and it fails, and then comes the question, Why did it fail ? Why were its limits of elasticity too small ? And you begin to investigate the steel, and you determine, first of all, the amount of carbon there. You may find that the amount of carbon is what you meant to be there, but when you examine the structure under the microscope, and when with the microphotograph you carry the thing a stage further, you have got really into the province of high research, and yet it is all done for a specific commercial purpose.

1020. (*Sir John Wolfe-Barry.*) That was exactly what was in my mind, that all the advance which has been made in the manufacture of ductile steel has really been to a great extent due to commercial compliance with specifications ?—Yes.

1021. And the specifications have been altered and improved from time to time as the result of what you call testing of samples ?—Yes.

1022. People then find out what can be specified and what cannot be specified. There is no regular basis specification to which everything complies, but the specification keeps altering as the investigations proceed ?—Can one take a better illustration than that of a man I mentioned before, Sir Andrew Noble, who began as a gunner and did a good deal of technical scientific work for the Government at Woolwich, then joined the big firm in the North, where he went for his technical knowledge, and is now the head of a great manufacturing firm, but at the same time has become by force of these investigations perhaps our first authority on certain branches of high science connected with steel and with explosives.

1023. (*Mr. Chalmers.*) You have in your mind, it seems to me, rather a wider and bigger institution than was ever thought of in the year 1897 by the people whose opinion you have read ?—I think when once you have set this going, at least I am sanguine enough to hope and believe when it takes hold you have got there a very big thing.

1024. (*The Chairman.*) You have at least the name of a very big thing ?—Yes.

SEVENTH DAY.

Wednesday, 5th June, 1907.

PRESENT :

The Right Hon. GERALD W. BALFOUR (*Chairman*).

Sir ANDREW NOBLE, BART., K.C.B.
Sir JOHN WOLFE-BARRY, K.C.B.
Mr. W. J. CROSSLEY, M.P.
Mr. ROBERT CHALMERS, C.B.
Mr. G. C. UPCOTT (*Secretary*).

Mr. CHARLES JOHN BAGLEY, called and examined.

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1025. (*Chairman.*) Mr. Bagley, I understand you are Managing Director of the South Durham Steel and Iron Company, Limited, and the Cargo Fleet Iron Company Limited ?—Yes.

1026. And other companies of a similar character ?—No.

1027. Only those two ?—Only those two.

1028. And a Member of the Council of the Iron and Steel Institute ?—Yes.

1029. You were invited to come here by the Committee in order to give evidence on behalf of the Institute ?—Yes.

1030. The Council, I think, had a petition upon this subject presented in the course of the last month ?—Yes.

1031. Would you kindly read out the petition ?—"We, the undersigned Members of the Iron and Steel Institute, engaged in technical work in various parts of the country, in view of the fact that the Treasury Committee now sitting to consider the work of the National Physical Laboratory, have not requested the Institute, notwithstanding that it is a subscriber to the funds of the Laboratory, to give evidence before them, beg to ask you to place our views, through our Secretary, before both the Committee and the Treasury. In our opinion, the undertaking of commercial testing as advertised in the price lists of the National Physical Laboratory and the general commercial policy of the Laboratory, are entirely opposed to the objects for which the Laboratory was established, and detrimental alike to the interests of manufacturers and to the highest class of research work. The object for which the Laboratory was established was to investigate the principles that underlie methods of testing and general research and standardising work, and it is contrary to the public interest that money should be wasted on routine testing which is efficiently carried out in private testing establishments. The requirements in *personnel*, methods, and appliances for commercial testing are so different from those for scientific research that if the two are to be efficiently carried out at the same Institution they can be done only by different staffs at great expense to the Government. We most strongly object to a subsidised Government Department being constituted a court of appeal or referee on technical questions, and that the acceptance or rejection of our manufactures should depend upon the results obtained by scientific gentlemen who, however high their attainments may be, are in no sense specialists or have any practical knowledge of our industries. We submit respectfully that, if this commercial policy is persisted in, the Council should consider the advisability of withdrawing financial support and of ceasing to be represented on the Governing Body of

an Institution which, in our opinion, is acting in opposition to the interests of the bulk of our members."

1032. Was that petition signed by a large number of the Members of the Institute ?—Yes, it was signed by a great number. I could not tell you how many.

1033. Including whom ?—Including Mr. Hadfield, our President.

1034. Were the signatories principally manufacturers or gentlemen engaged in testing work ?—No, I do not think there were many in testing work. They were mostly manufacturers.

1035. We have had abundance of evidence before us relating to the objections taken by persons engaged in testing to the work done by the National Physical Laboratory, but very little so far relating to the objections taken by manufacturers. I see you have prepared, in your *précis*, a somewhat full statement of the reasons on which the objections of the manufacturers are based. Perhaps you would state those to us ?—The principal reasons are these. First, the National Physical Laboratory was established specifically to undertake standardising and research work arising therefrom, as definitely laid down in the reference to the Committee of 1898, in which not the slightest reference or suggestion is made as to any commercial work being undertaken. This is further emphasised in various parts of the Report of the Committee, and in this connection I would call special attention to the concluding sentences of paragraph 9 of the Report, which read as follows : "We could give other instances of the same nature and have merely referred to the above subjects as examples of such matters as would, in our opinion, be proper for investigation at a public institution, as distinguished from the ordinary testing of materials used in commerce or in construction and machinery, which can be and now is efficiently conducted at private establishments." And I would wish this to be in connection with a heading on page 7 of the Engineering Test Pamphlet in which the National Physical Laboratory offers to undertake the particular work which it is here specifically recommended by the Committee they should not do, the actual heading being as follows : "The Testing of Materials of Construction"—tests of shafts, riveted joints, ropes, chains, belts, etc., etc.—which is identical with paragraph 9 referred to. The members of the Council of the Iron and Steel Institute supported the National Physical Laboratory when it was instituted on the definite understanding that the recommendations of the Committee of 1898 would be carried out, and they contend that this and similar commercial work is contrary to the purposes for which the Laboratory was established. Secondly, they wish me to submit that in their opinion such work cannot fail to interfere seriously with the research work of the National Physical Laboratory and greatly retard its usefulness. As business and technical men, they know, from their own experience, that it is impossible to carry on, successfully, scientific investigations involving really important results and at the same time conduct commercial work. Either the staff will become absorbed in the scientific investigations, when the commercial work will be more or less neglected, or the energies of the staff will be expended in the commercial testing, when the scientific work, which was the *raison d'etre* of their establishment, will have to take a second place. If an entirely independent staff was appointed to do commercial work, this would mean extra expense, and this could be far better done by a Government establishment in London. I believe it is contended that so far the commercial work has been so small that this has not interfered either with scientific work or private interests ; but I understand the reason for this is, that up to the present time they have not had a mechanical testing machine, or a Laboratory or staff capable of doing ordinary commercial testing; and, in fact, it is stated in the Testing Pamphlet that a powerful machine is now in course of erection and that when it is completed, they will be prepared to undertake the usual commercial tests. It is clear that unless a very considerable amount of work is undertaken, more financial help will be required from the Government, and if any considerable amount is taken, so that it is made a commercial success, it must largely interfere with the research work and also seriously compete with professional men. There is no real reason for doing this work except to make money, and it is not a question whether, up to the present, it has made £50 or £500 a year ; unless it can show a profit the work will be of no use to the National Physical Laboratory and only a burden, and one of its main endeavours, if commenced, must necessarily be to get as much work as possible to increase the income.

1036. You are no doubt aware, because I think you refer to it later on in your *précis* of evidence, that the National Physical Laboratory considers that a certain amount of commercial work is necessary for the training and practice of the staff. But apart from that I conclude that in your opinion any such testing work as they are at present carrying on must be carried on at a loss ?—No, I do not say that it is carried on at a loss.

1037. But you say that unless a very considerable amount of work is taken more financial help will be required from the Government ?—You will require a very large staff probably.

1038. A very large staff in the event of the work being large ?—No, you will require two staffs, one for commercial work and the other for scientific research.

1039. But does not the statement you have just made to us amount to this, that such work cannot be made to pay unless a very large amount of it is done. At present a very small amount of it is done, and therefore I presume it does not pay ?—I may not have made that clear, but I think it would require two staffs. Two staffs probably would be very expensive.

1040. I think that is another point. What you have put to us here is that the National Physical Laboratory is face to face with this alternative ; either it must do a small amount of this work, in which case it would not pay to do it at all, or it must do a large amount of the work, and in that case it will interfere with the interests of professional men ?—What I say is that unless a very considerable amount of commercial work is taken, more financial help will be required from the Government. I do not say it will be done at a loss. I say it will require a very large staff and need more assistance from the Government. I say in paragraph 2, about the middle of it : "It is clear that unless a very considerable amount of work is taken more financial help will be required from the Government, and if any considerable amount is taken, so that it is made a commercial success, it must largely interfere with the research work."

1041. You say there is no real reason for doing this work except to make money. "It is not a question whether up to the present it has made £50 or £500 a year ; unless it can show a profit the work will be of no use to the National Physical Laboratory, and only a burden." Do you suggest that at the present time, the work being small, there is no profit upon it ?—It is very highly probable, but I am afraid I have not put it clearly. What I mean is that you would require more financial help from the Government, and you would require a very large staff to do the commercial work.

1042. As you have your *précis* before you perhaps I might refer you to page 7, where this alternative is again presented. You say : "I will only remark that if the department undertakes a large amount of work, which it must do to be a financial success, it must very seriously interfere with the private professional man. If on the other hand it takes only a little work, as it has done in that past, it will be a financial burden, and further assistance will be required from the Treasury ; such work can only pay when conducted on a large scale" ?—Yes, I really mean to make out there should be two staffs. If the one staff did a lot of commercial work they would do very little research, and, *vice versa*, if they did very little commercial work it would probably entail a loss.

1043. I gather that you think that the National Physical Laboratory must either do a very small amount of this work or a very large amount of this work. But is not a middle course possible ? May it not do enough of this work to supply that training and practice which in the opinion of the Laboratory authorities is required, without seriously or even appreciably interfering with the work of professional men ?—I should say if the commercial work is done just to train men for scientific work it will not be done efficiently.

1044. Perhaps you would pass on to paragraph 3 ?—Those members who are manufacturers further object to having a subsidised Government institution constituting themselves referees in trade disputes. We have not the slightest objection to having our materials subjected to the most rigorous tests, but we submit that we have a right to ask that such tests shall be conducted by men of experience and special knowledge, who are able to interpret results in the light of wide experience. I say most emphatically that, in my opinion, and certainly in the opinion of most of our members, we would infinitely prefer to have our material judged by such men than by scientific men, however able they may be from a purely scientific point of view, who have admittedly not had any practical experience in dealing with materials which we manufacture.

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It must be admitted, and is admitted in the report of 1898, that there are various firms in different parts of the country dealing both with the mechanical and chemical side of the testing whose work is thoroughly efficient and who are absolutely above suspicion, as is shown by their reports being accepted by the leading engineers, the Government Departments, and the largest of the contractors, and we contend that this attempt on the part of the National Physical Laboratory to obtain this work is not only contrary to our interests as manufacturers, but to the public interest generally, as well as to the future of the Laboratory. We are of the opinion that certificates of reports issued with a Government stamp from a semi-Government department will carry far more weight than they are entitled to, especially with non-technical men, and these may be used in various ways by unscrupulous persons for personal ends. It is also evident that it is quite impossible that they can have a staff capable of dealing with all the varied industries : each industry would require a special expert, and there is no reason why our particular industry should be selected for experiment.

1045. What do you exactly understand when you speak of a "subsidised Government institution constituting themselves referees in trade disputes" ?—Well, there would be no appeal. The firms that I am connected with, I may say, test 10,000 tons a week of material, and we have disputes at times, and we refer to either Mr. Riley, of London, or Mr. Stead or Mr. Pattinson, of Newcastle, someone we mutually agree upon, and if we still do not agree we refer to some umpire, whose decision is final, and abide by his award. But in the case of the Government there would be nothing of the sort ; their decision would be final, and you would not be able to ask for a second investigation or testing.

1046. But the National Physical Laboratory does not claim that disputes should be referred to it ?—No, but testing naturally involves disputes occasionally ; not often.

1047. Do you see any objection to two parties to a contract agreeing together that in case of dispute the matter shall be referred to the National Physical Laboratory ?—I think it would give too much weight to the verdict. We are rather afraid that a verdict from the Government might damage us, but it is a mere nothing a verdict from anyone who is in the trade. We are quite willing to abide by it, if there is a dispute, but we should not think so seriously of it as we would of a verdict from a Government laboratory.

1048. Supposing the arrangement was that the Laboratory should act as referee only in the event of the two parties to a contract agreeing together to refer to it any dispute between them, should you see any objection ?—Oh, no.

1049. It is only in the event of the Government claiming that, if a dispute arises, it shall be referred to the National Physical Laboratory that your members would raise any objection ?—When you say, is there any objection? if there are only trifling disputes as to whether a piece of steel is within its limits a decimal percentage or so, it is only a trivial matter, and we would hardly like to have the Government called in. The Government are also customers of ours, and it might prejudice us in their eyes. We have done, I daresay, 50,000 tons in the last few years for the Government, steel plates for shipbuilding. Take an instance we had not long ago. We had a young inspector, who was a novice, and his instructions were that the tests were to be 28 to 32 tons. The steel had to stand 28 to 32 tons tensile per square inch, that is the ordinary testing for Lloyds. This ran out to 27.7, and he wished to condemn it. We could not refer that, because we quite admitted it ; there was no dispute about it. We only said to him, well, in the case of steel, if it is above the limit and it is hard, we never ask for it to be reconsidered, but if it is below the limit, all practical inspectors who take large quantities would pass it ; but he would not. That might have been referred to this National Physical Laboratory, and they, not knowing the point that it is of small importance being below the limit, might put a black mark upon us, and you might have two or three like that, and then you have an enquiry for 2,000 or 3,000 tons from the Government and it might interfere with your getting the order, thinking, perhaps, our steel was not so good as others, when, perhaps, it was a little better by being a little softer. Commercial men know that, and never hesitate to pass a thing that is a shade below on the soft side. There are many points like that that I cannot illustrate offhand.

1050. Does that mean that you would object to any reference testing by a Government or *quasi*-Government Institution, because you think that such an institution would be more rigid in its demands ?—They would be less practical, because they would not be so accustomed to this sort of thing. They would be more scientific men, who would be very exact.

1051. Would not the reference be in this form, whether such and such material does or does not come up to the terms of the specification ?—Yes. We would not dispute it ; but we would ask him to pass it if he could see his way, because it is really better steel than he is asking for.

1052. But if such a question was referred to the National Physical Laboratory, all the National Physical Laboratory would have to do would be to say whether that material did or did not come up to the specification ?—That is what we are afraid of. They would not give or take. A commercial man would pass the thing, whereas they would not.

1053. (*Mr. Chalmers.*) Your point is it is better material? —It is better material.

1054. (*Sir John Wolfe-Barry.*) But surely the dispensing power does not rest with the testing authority. When you say, I will pass something which does not pass the specification, that is not a matter for the testing authority, that is a matter for the principal officials of the Government ?—They would not have to come in unless it was reported to them it was not up to the mark. They would test it and say it was not within the limits. We would say, it is rather better, and you can take it to any large testing house or any commercial authority, and he would pass it, whereas a Government official would not.

1055. (*Chairman.*) The testing authority has not to pass a material. It has merely to state whether a particular material does or does not answer to a particular specification. If the tester finds that it does not answer to a particular specification, and the deviation from the specification is one which constitutes an advantage rather than a disadvantage, it would then be not for the testing authority but for the Government or contracting firm to decide whether it should be accepted ?—It never gets so far as that. It is the man who does the test who does it. He says it is right or it is wrong. We never have these things referred to the shipbuilder. Sir Andrew Noble never gets troubled with things like that. He leaves it to the inspectors.

1056. Then will you pass to paragraph four ?—It is a well-known fact that the officials in subsidised departments, not having the spur of competition, tend naturally to become more or less stereotyped and conservative as to their methods ; red-tapeism gradually asserts itself, causing delays which result in great inconvenience and pecuniary loss to manufacturers. In dealing with Government Departments this is a frequent source of complaint with manufacturers, and the very fact that the National Physical Laboratory is situated some distance out of London, and therefore is not within easy reach of engineers practising in London, must inevitably cause certain delays.

1057. There again, that objection rests upon the supposition that the National Physical Laboratory would be, in some way, forced upon you as a testing authority. If it was not forced upon you it would be for the contracting parties to agree whether or not they would have the National Physical Laboratory as final arbitrator. The mere fact that the National Physical Laboratory is willing to act in that capacity is not a matter to which you can take reasonable objection, is it ?—Well, I do not think we would refer, for these reasons, that there would be delay, and it would be awkward to get at, and these are objections that arise in my mind. If anyone offered it, I should say it is no doubt a first-rate institution, but I should rather not refer to it, mostly because of delay, and also inconvenience in getting at the place. With reference to the National Physical Laboratory undertaking Government testing apart from research work, we submit that this is just as much outside their province as testing for private engineers, and if the Government desire to have a testing establishment of their own, it should be established entirely for this purpose and placed under the control of men of wide, practical experience, who would be required to devote their energies entirely to this class of work, and this work should not be carried on just as an adjunct to subsidise the funds of the National Physical Laboratory. In such a case, of course, there would be no question of such a department undertaking other than Government work.

1058. Do you object, on principle, to the Government having a testing establishment of their own ?—Oh, no.

1059. Your only objection is this : that you think that to use the National Physical Laboratory for that purpose would impair its usefulness in other directions ?—Yes. With reference to the competition with the professional members of our Institute, this is a matter which, I believe

has already been dealt with by other witnesses who have more special knowledge of the question than myself, and I will only remark that if the department undertakes a large amount of work, which it must do to be a financial success, it must seriously interfere with the private professional man. If, on the other hand, it takes only a little work, as it has done in the past, it will be a financial burden, and further assistance will be required from the Treasury; such work can only pay when conducted on a large scale. I understand that it is contended by the National Physical Laboratory that this commercial work is necessary for the training and practice of the staff; but I would point out that if the staff had so little experience that they want commercial tests for practice, it is hopeless to expect that the results of their scientific investigations (which require far more accurate and delicate work than is required for ordinary testing) can be of any real value to the nation. It is absolutely necessary, of course, that before a man can effectively undertake scientific investigations of national importance that he should be an efficiently trained man of experience, capable of doing any ordinary testing work which may arise in the course of his investigations. If it is contended that commercial work must be undertaken to keep the staff fully employed, it only shows that, if they cannot find sufficient research work to keep them fully engaged, there is no sufficient reason for the Treasury subsidising a research laboratory at all. We, however, know there is ample work to be done, and in our own particular branch any of our leading metallurgists could suggest far more work than the entire staff could deal with for many years, apart from the numerous problems in the other varied industries which are waiting for solution. I would further point out, if the Laboratory expects the co-operation of manufacturers and of professional men, that, so far as we manufacturers are concerned, if an important part of their work is to investigate and report upon our mistakes, even when we are in the wrong and they are in the right, such work is liable to be a source of irritation and not necessarily lead to the best relations.

1060. Does not that again rather assume that in your mind an apprehension exists that the testing work done by the Laboratory will be of a compulsory character, will be forced upon you?—No, I am only afraid if it comes into force.

1061. You say "An important part of their work is to investigate and report upon our mistakes." It would only become so if they were called upon to report upon your mistakes. From the evidence you have given us it does not appear likely that they would be called upon by private firms and individuals to carry out tests, and this would only, therefore, be done, I presume, by Government Departments?—They might be called upon; say someone had got a twist with someone and they thought they would put us through our paces, and call in the Government and have it tested by the Government; if they got a verdict against us, they would think they had scored a lot, and we should feel rather sore about it, whereas there is no need for that, because it is only a small affair, a little difference in the testing.

1062. I think you desire to explain to us that, notwithstanding the criticisms you have passed on some work of the Laboratory, you are not by any means hostile to the work of the Laboratory as a whole?—No, certainly not.

1063. Have you any suggestion of your own to make with a view to facilitating and developing the scientific work of the Laboratory?—There are a great many points that, I think, the Laboratory could investigate, of great importance to the steel trade, such matters as segregation in ingots. That is a great difficulty we have. We want to know how to get rid of it. Such questions as working steel at a blue heat; that nearly always causes fracture, and we do not know why. There are a great many technical points that you may not follow, perhaps. I think the Laboratory might do very good work in those.

1064. Have you asked the National Physical Laboratory to undertake work of that description?—No, we have not asked them, but, I think, it is work which would repay the Government, and the public would very highly esteem it.

1065. Do you think it desirable that the National Physical Laboratory should be associated in any closer way than at present with manufacturers?—I think, with this suggestion of mine, to work together with the trades they would get great assistance. Say with the steel trade, they would get great assistance from our experts.

1066. You mean your experts would be prepared to co-operate with the Laboratory in carrying out certain experiments?—Yes. I think they would be very pleased to make use of your instruments and work along with your investigators. I feel sure they would.

1067. But you are of opinion that there would be an unwillingness to do that so long as an impression prevailed that the Laboratory was competing unfairly with private interests?—Yes, I think that is the opinion.

1068. (*Sir John Wolfe-Barry.*) Who are the signatories to the statement that you have been reading. Would you give a list of the gentlemen?—I have not brought it with me. I have the document.

1069. Would you send it to the Secretary?—Yes. I suppose I shall have to ask the Institute if I may submit it. With their sanction I will do it.

1070. I think you said Mr. Hadfield is one?—Yes, Mr. Hadfield is one.

1071. He is one of the representatives on the Executive Committee?—Yes.

1072. And from the first the Iron and Steel Institute have been continuously represented on the Executive Committee?—Yes, I understand so. The Consett Iron Co. is represented.

1073. First of all the late Sir Robert Austin, Mr. Hadfield, Mr. E. P. Martin, and the late Sir Bernard Samuelson?—Yes; Mr. Samuelson is a signatory.

(*Mr. Chalmers.*) They are not on the Executive Committee.

1074. (*Sir John Wolfe-Barry.*) They are on the General Board. On the Executive Committee two of those whose names I read out are dead. Mr. Hadfield is on the Executive Committee?—Mr. Colville, of the Dalzell Steel Works, is one, and Mr. Ainsworth, of the Consett Iron Company. I must ask the sanction of the Iron and Steel Institute Council if I may submit those, and I shall have pleasure in sending them in.

1075. But do you appear as representing the Council?—Yes.

1076. You are deputed by the Council?—Yes.

1077. With regard to the subjects for investigation, I suppose there is no difficulty in suggesting subjects?—No.

1078. They have been suggested by other parties?—Yes, there are any number. I expect they would keep them fully employed.

1079. And some very interesting experiments have taken place on the suggestions of various persons?—Yes.

1080. (*Mr. Crossley.*) Has the Council seen your *précis* of evidence?—No. I only got it finished the night before last.

1081. And this is entirely your own writing?—I have had assistance and talks with the members.

1082. But even although the Council might sign it, they have not seen it or approved it?—The Council have not signed this.

1083. Or seen it?—No.

1084. Or approved it?—No. I have been sent to represent their views, and have discussed this with them, and this is the upshot of it; but they have not seen this.

1085. (*Mr. Chalmers.*) Though you have not got any precise and definite instructions from the Council, you know the minds of the Council, whose representative you are?—Yes.

1086. And what you say you take to be the expressions of their views? Yes.

1087. I should like to ask you a question or two of a practical character, if I might. Would you give an example of testing within the scope of the Institute's interests?—I should say such a matter as segregation.

1088. Sample testing. Anything that would at present come into the hands of an outside person, or might go to the Laboratory. What would you take as a sort of instance of routine sample testing? Take a case about steel, for instance, if you like?—I do not know that I quite understand what you mean. As I said, we test a great quantity of stuff every week.

1089. Will you give instances of it. I am not a practical man; you are. I wanted to have your general opinion. There is certain work which you think should not be taken away from outside practitioners and given to the Laboratory. What sort of work had you got in your mind, for instance?—We have contracts subject to Mr. Kirkaldy's testing. That is a testing house; and we have it subject to Messrs. Nash and others. These people do an immense lot of stuff. They have a trained staff. They do thousands of tons a day.

1090. Would you say tensile tests?—Tensile tests, and elongation and bends, and various tests which are always

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specified. Every specification has a tensile test, and an elongation test, and a bend test—hot bend, cold bend, quench bends.

1091. Chemical tests for the amount of carbon, for instance?—Yes, there are chemical tests for carbon, phosphorus, and sulphur. Very often, not always, for them.

1092. Those are the sort of routine sample tests that you think should be retained in the hands of private practitioners?—Yes; they are done so quickly.

1093. With reference to some evidence that the Committee had on a previous occasion, could it be said that sample testing shades imperceptibly into research?—No, there is no time and no attempt to do it. Research requires certain instruments added to the instruments we use.

1094. Can it be said that sample testing is a real help to research?—It is a great practical experience.

1095. Is it of real help to research that sample testing should be carried on concurrently?—No, but I should say your staff should be composed of men who have had great experience in sample testing before.

1096. Not to carry it on at the same time?—Not to learn it at the time, but to have experience to start with.

1097. Would you give sample testing to a man whose business it was to test samples, or to an institution whose business it was to go into research?—I should go to a man whose business it was to test on a large scale.

1098. Generally speaking, I take it you think the National Physical Laboratory would do best from your point of view by sticking to its last, and leaving other things such as sample testing to private professional men who would do it as well?—That is the Institute's position.

1099. And in giving that opinion you are speaking for manufacturers?—Yes, from the manufacturers' point of view.

1100. (*Sir Andrew Noble.*) If the National Physical Laboratory charged for their tests at least equal or perhaps higher than the ordinary analyst, would you see any objection to questions being referred to them, as long as they could not be said to compete?—It is not a question of price at all. I think if they did it very much cheaper, we would not care to send it to the National Physical Laboratory. We prefer not to send it to the National Physical Laboratory. We are very much afraid of tyros. At some of our works we get a new man who has never done any testing, except perhaps once a year.

1101. I share your view about tyros, but are you aware that in Government specifications, in addition to the chemical analysis and in addition also to the mechanical tests, there is a provision that the steel is to be to the satisfaction of the inspecting officer?—Oh, yes.

1102. In that case the inspecting officer may be, as you call it, a tyro?—Yes; then we are in the soup.

1103. Would it not be of advantage if we could get competent people, who I am quite sure will be found by the National Physical Laboratory, that there should be power to refer a question of that sort to the National Physical Laboratory, that their opinion would have weight with the Government probably which no private experimenter's opinion would have?—I think in the case of Government contracts it would be all right, but in the case of other contracts I do not think they would care about it.

1104. That is to say you would not object to it?—No. I am not quite sure that I made myself clear. You say: "That is to say, you would not object to that." What do you mean quite that I would not object to? I do not know whether I quite caught your point.

1105. (*Mr. Chalmers.*) To have the Laboratory as an umpire?—I think we would object to that.

1106. (*Sir Andrew Noble.*) But why should you, if they were good and efficient men?—They would not have the experience of these testing houses. It would be impossible, I should say, without robbing them of a lot of work.

1107. If they get the work they get the experience. However, that is your view?—I do not think we should care about it. As I said before, it carries too much weight for such a trifling matter. It is not a matter of importance.

1108. (*Chairman.*) There is one other question I should like to ask you. The observations that you have made refer, I presume, exclusively to ordinary routine testing of samples?—Yes.

1109. Has the further question of investigations to be made by the National Physical Laboratory at the expense of some private individual or firm come before your Institute?—Yes.

1110. Have you considered it at all?—Yes. We think that this National Physical Laboratory is the very thing for research work. There are so many things that we have not time to investigate which are of very great importance.

1111. Yes, but if such researches were made with a view to the commercial profit of some particular firm by whom the expenses of the investigation are defrayed, do you consider it is legitimate for the Laboratory to undertake such work?—That is, any special firm paying the Laboratory for their research?

1112. Yes?—I should say there would be no objection to that. It would be greatly used for that, I should say. Besides the researches they carry out themselves, they would be asked to carry out researches for individual firms.

1113. Do you think that publication in such a case should be an invariable condition?—Yes, I should say so.

1114. An invariable condition?—I should say so.

1115. Your idea would be that the Laboratory should not be allowed to undertake even research work for private individuals or private firms unless the results were published?—No, because they are getting financial aid from other societies who would expect to get the results.

1116. (*Mr. Chalmers.*) Would you expect that you would pay the National Physical Laboratory to undertake any such research on your account then?—Yes, research that entailed considerable investigation.

1117. (*Chairman.*) Do you think, under such circumstances, it is likely that many firms or individuals would request the Laboratory to undertake researches for which they were prepared to pay?—I do think so. I think there is quite an opening for this. I think there are many subjects that they would be prepared to pay for, but the other members would expect to see the results.

1118. (*Sir John Wolfe-Barry.*) But when would they expect to see the results? That is another point?—As soon as they are known.

1119. (*Sir Andrew Noble.*) Would it meet your view if the condition were made that it should be published after a certain number of years?—No, it should be done at once.

1120. Why are you to give them to other people?—Because the other people are paying. I do not know that that is the view of the Institute quite on that point, because it is a point that has not been raised, but it is my view.

1121. (*Mr. Crossley.*) Supposing a firm wishing to elucidate a question which was important to them were willing to pay one figure to keep the results private, or a lower figure to publish them, would that meet your view?—No; I think it ought to be published, because some big firm might keep your whole staff engaged for a long time on investigations, and others might not be able to get at it.

1122. I am sorry I was not here at the beginning, I rather lost touch of your evidence. You said "we did this and we did that." Do I understand that the Institute have a testing house of their own?—No.

1123. Whom do you mean when you say "we" tested 10,000 tons of steel per week, and so on?—I do not think I said that. I meant my companies did that. But "we" represents the Iron and Steel Institute. There is a petition put in by the Institute and signed by a great many, and they say we did this and we did that.

1124. But you said "we tested 10,000 tons of steel per week?"—When I said that, it is the private firms I am connected with.

1125. Then are you a tester?—No, I am managing director of these two firms.

1126. Then who tests for you?—We have test houses, and we have our own inspectors who test the steel before ever it is submitted.

1127. Then you are interested in these test houses?—Yes.

1128. You have a financial interest in the testing?—Yes. Our steel has to be tested before it is passed.

1129. Yes, but you have a financial interest where your samples go?—It is on our own establishment.

1130. (*Mr. Chalmers.*) You have not a financial interest in the outside tester?—No.

1131. You told me that as a manufacturer you have got tests of your own, by your own employés?—Yes.

1132. (*Mr. Crossley.*) In your own works?—Yes. We have no financial interest in any testing houses.

Mr. THOMAS NASH, called and examined.

1133. (*Chairman.*) You are the Director of the Sheffield Testing Works ?—Yes.

1134. Established by your late father in 1880 ?—Yes.

1135. And you speak on behalf of members of the Iron and Steel Institute engaged in the practice of mechanical testing ?—Yes.

1136. Have you been deputed by them ?—Yes, I was nominated, I understand, by the Council and asked by the Council if I would give evidence, and I consented.

1137. Will you describe to us the character of the work done at the Sheffield Testing Works ?—Yes ; it is mechanical testing principally, tests made with a view of showing whether material conforms to certain specifications, and whether it is suitable for certain classes of work. The bulk of it, of course, would be ordinary tensile tests and transverse tests, compression tests, torsion tests, shock tests, impact and double sheer, the cutting qualities and properties of special steel.

1138. So far as your experience has gone, you have not been asked to carry out any tests or any experiments which you are not able to carry out ?—No ; it is a remarkable thing, since I have been the Director, we might conceivably have been, but we have not, as a matter of fact, had to refuse or failed to carry out anything that we were asked in the way of testing. I put that forward to show that there are sufficient facilities at present for all ordinary testing.

1139. What is the power of your testing machines ?—The largest one in point of weight that we put on is 200 tons ; we put that on every day. The machine is designed so heavily that we do that regularly. We could, of course, put 400 or 500 on if we liked.

1140. Is application ever made to you to carry out tests which are more or less in the nature of experiments and involve a certain amount of research ?—Yes, sometimes.

1141. And do you carry out those ?—We should call it conducting an investigation. For instance, the other day some people came to us and they wanted to know why a certain axle broke. We made microscopic observations of the sample, in addition to what I have just mentioned, in order to try and ascertain why the axle broke, because the more common test did not show it.

1142. Is that a kind of test or investigation, call it by what term you please, which you think it would be illegitimate for the National Physical Laboratory to undertake ?—No, it is a special work. You have heard all our evidence over and over again from the others ; it is all the same. We want to try and protect our interests as far as we can, but the danger is this, that if the National Physical Laboratory unfairly competes with professional men, you might drive them out of the business. You will not have any alternative left. Suppose it comes to litigation, instead of being able to go to Mr. Kirkaldy, or to Mr. Stead, or one or two more, you will only have the National Physical Laboratory, because if they have got State aid, they will be able to cut us out.

1143. I think I fully understand that, and presume that the representations you wish to make to us are practically the same as those that have been made by Mr. Kirkaldy and others that are engaged in testing work ?—Yes.

1144. But there is one point I wish to put to you, and to which I should like to have your answer. You have just said that there are certain tests which you are asked to undertake which pass beyond ordinary routine work and partake to some extent of the character of investigation ?—Yes.

1145. You quite admit that investigation is a proper part of the work which a National Physical Laboratory may undertake ?—Yes, I might say that I should think that that investigation would not go as far, would not be so minute, as research work for the National Physical Laboratory. What I understand by research work is to start with a sample, the history of which is known as far as possible and follow it through to its ultimate knowledge, not to merely stop when you find out why the thing broke, but to find out all about it.

1146. I follow that, but the point I wish to obtain an answer from you upon is this. Does not ordinary testing work pass by insensible degrees into testing work which can only be properly described as investigation, testing work that undoubtedly does partake of the character of research ?—I would not say by imperceptible degrees. It is a big thing when we get a thing like that ; we do not gradually drift from one thing to the other. We are asked to test this thing, and we start ; we put all the testing in hand at the same time, microscopic tests, and mechanical tests, and all the other tests simultaneously.

Mr. T. Nash.
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1147. Are there not a number of intermediate cases, cases with regard to which it would be difficult to say whether they involved an amount of research sufficient to justify, according to your view, the National Physical Laboratory in undertaking them ? In other words, are not there marginal cases, cases on the line which it is difficult to decide ?—Of course, it must be in everything, certainly. All I want to say more is that there ought not to be any commercial competition from this Laboratory, because there is much more important work. It surely is a very small thing whether they earn £200 or £300 a year, or whether they do not. But surely it is a very big thing that they should do this very important research work which is waiting, and which no one else can afford to do.

1148. Yes, but they have to decide a practical question. Supposing certain testing work is submitted to them which partakes of the character of research, are they or are they not, according to the principles which you think they ought to follow, to undertake that work. I want you to tell me whether you think there are cases in which there may be a difficulty in deciding whether the work would or would not be legitimate, from your own point of view ?—Of course, there are cases where it would be difficult, and the occasional tests would not matter much.

1149. (*Sir John Wolfe-Barry.*) Are there other testing works at Sheffield besides yours, in independent practice ?—There is one.

1150. What is the name of that one ?—It is a new concern. It is called the Yorkshire Testing Laboratory, I think. It is a new and very small concern, I believe.

1151. May we take it you represent their views as well as your own ?—No, sir, we do not recognise them.

1152. Do you represent any other testing works or establishment, specifically ?—Yes. I recognise them and I respect them. There is Mr. Kirkaldy's.

1153. But I mean at Sheffield ?—No, I do not.

1154. But Mr. Kirkaldy has already given evidence, and, therefore, of course, we know what he says ?—Yes. I mean Mr. Kirkaldy and Mr. Stead, etc.

1155. But do you think there is any reasonable probability of the commercial work which is now tested at Sheffield being sent up to Teddington to be tested ?—I think there will be, if they go in for commercial work in a commercial manner.

1156. You mean if they undercut ?—Principally if they undercut.

1157. If they undercut or quote lower prices ?—Yes.

1158. But otherwise is not it obvious that the convenient place for testing Sheffield work will be at Sheffield ?—Yes.

1159. Do you do any specific research work ? I mean do you undertake, say, the investigation of alloys for clients ?—We do not go as far as we should call research. When we say research, we mean to follow it out regardless of time and cost or anything else, without any financial consideration whatever.

1160. You are not employed to do that by anybody ?—I only do research work as a hobby for myself. We do not engage in it. It is a thing that might take 10 years or 10 months.

1161. You do not undertake that work for other people who are studying the subject ?—I suppose we should do it, to a limit, if they explained what they wanted.

1162. I should have said you have not done it ; it is not your practice to undertake research work ?—Not what we call research work.

1163. (*Chairman.*) But you have undertaken experiments ?—Yes.

1164. Something which is beyond ordinary testing ?—Yes.

1165. (*Mr. Crossley.*) Supposing the National Physical Laboratory charged double the ordinary trade fees, you would not call that commercial competition, would you ?—No, I should not.

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1166. Then supposing there were certain people who wished to have the opinion of the National Physical Laboratory at that price, you could not object, could you? —Personally I should not. I was asked to give evidence on behalf of those members who are practising, and I suppose I must stick to that, must I?

1167. (*Chairman.*) I think you may express a personal opinion, and also the opinion of your friends, if you are deputed by them to give evidence?—Of course, if I was to speak for myself, I am principally afraid that ultimately this will come to undercutting. It will not start with that, but it will come to it; that is really what I fear, to be quite candid; that is all.

1168. (*Mr. Crossley.*) The carriage of samples comes to a very considerable thing, and we have been told by other witnesses that the great trick of the trade was to get these things through quickly?—Yes.

1169. It would take a long time to get samples to Teddington and get them back?—Yes.

1170. Where is the fear of competition from the National Physical Laboratory except in very rare instances?—Take Mr. Kirkaldy; it would affect him more than us.

1171. I do not think he is as much afraid of it as you are. Do you make chemical tests too?—Yes.

1172. I suppose rarely, not very often?—Very often, yes.

1173. You said you undertook the testing of this particular axle. It would be rather interesting to know whether you found out why that axle broke?—Yes, I found out the reason.

1174. (*Mr. Chalmers.*) I should like to ask you a question as to practical tests further on the subject that the Chairman touched on; that was the graduation of sample testing into research. Is it a fact that the testing of a sample can really shade off into research? What is the testing of a sample? It is as to whether it comes up to specification, is that not so?—But this axle that I referred to had stood all the specified tests, but then the people came to us and said: Although it stands all the recognised tests it is still faulty—it broke. It had a large factor of safety, and yet it broke.

1175. Yes; that was something outside the specification?—Yes.

1176. But if you take an ordinary sample, and it has to come up to specification in certain fixed particulars, all you do is to see whether it does or does not come up to specification?—Yes.

1177. That does not in itself lead to research, does it?—No.

1178. Is the testing of samples a matter of great practical familiarity with the work? I presume that must be the case; you have to be very familiar with samples to be able to make your tests with certainty and promptitude?—Yes.

1179. And if you do not have a great mass of work I suppose you do not keep your hand in. That would be so, would it not?—The more practice you have, the more expert you become, of course.

1180. As regards the competition of the Laboratory, there is not only the fee, but the name, I suppose?—Yes. The National Physical Laboratory charging 10s. would be equal to someone else perhaps charging less, because some people would think they had got a great weight with it.

1181. That would be very useful for advertising purposes, would it not—the name of the National Physical Laboratory?—Certainly.

1182. I suppose if they charged double fees that would not prevent people paying double fees for that sort of purpose?—No, it would not.

1183. Therefore it is not only the amount of the fee, but the name, that is present to your mind in objecting to the competition?—Yes.

1184. (*Sir Andrew Noble.*) Do you make chemical analyses of the samples submitted to you for tests?—Yes.

1185. And you make reports also, I suppose, upon the steel submitted to you?—Yes.

1186. But as to research work, do you do anything of that?—No, we do not do research work.

1187. (*Mr. Crossley.*) Would you go so far as to say that because a man might use the name of the National Physical Laboratory for an advertisement that he, no matter what he paid, should be prohibited from having a sample tested there if he wished? I cannot see this objection at all to a man's having a sample tested and advertising the fact if he chooses?—It is a case of the public interest. As long as this commercial work does not interfere with the research work, I suppose there is no objection to it.

1188. Is your chief care to preserve research work?—It is more important than making a few pounds in commercial work.

Mr. Richard Evans Spencer, called and examined.

r. R. E. pencer.

1189. (*Chairman.*) Do you represent the firm of Sir W. G. Armstrong, Whitworth and Co.?—Yes.

1190. Are there any points in connection with the enquiry before the Committee on which you wish to give evidence?—Yes, I wrote yesterday mentioning four.

1191. Will you take those one after the other, please?—One is that cases of disputed chemical analyses occur in connection with the carrying out of Government contracts by contractors. With reference to that I can produce evidence to show that since 1902 several cases have occurred where the results obtained by the Government chemist and our own chemist have differed in chemical analyses. Shall I mention the particular cases?

1192. I should think that is hardly necessary. We will take it from you that such cases have occurred?—They are in each case with reference to chemical analyses.

1193. (*Sir John Wolfe-Barry.*) Has the issue been important in these cases?—Yes, rejections of material supplied have taken place.

1194. (*Chairman.*) Do you think it is desirable that the National Physical Laboratory should be called in to settle such disputes?—Yes, I think so. Their chemical analysis result could be recognised by the War Office. At present we have no appeal. In the case of such a dispute as I mention, we have no appeal at all; we are bound to take the chemical result obtained by the War Department chemist; his decision is considered final.

1195. What you would like would be that a provision should be inserted in the contract between yourselves and the Government that in the event of dispute a reference should be made to the National Physical Laboratory?—Yes.

1196. And you think that the National Physical Laboratory ought to be prepared to undertake such work?—Yes; I think it would be very advantageous, because it would be, of course, a Government establishment, and it would be the best Court of Appeal that we could have with regard to a dispute with either the War Office or the Admiralty.

1197. Supposing you had a dispute with some other firm, and the Government was not concerned in the matter at all, do you think that the duties of an arbiter could be usefully performed by the National Physical Laboratory in such a case also?—Yes, but I do not know that it would be necessary to go to the National Physical Laboratory in such a case, because it is almost invariably agreed that a third independent chemist shall be resorted to in the case of a dispute, and any recognised firm of analytical chemists is taken as the arbiter. It would not, in the case of a contract with any other firm, be necessary to go to a Government establishment.

1198. But if you and the Government agreed that in the event of a dispute the dispute should be referred to any one of these arbitrators whom you now mention, do you think that would be less satisfactory than a reference to the National Physical Laboratory?—It would meet the question at issue; but I should have thought the fact of referring to a Government establishment would have carried more weight, that it would be a better Court of Appeal.

1199. (*Sir Andrew Noble.*) You had better state exactly what took place upon the instance that you cited to the Chairman—what the point in dispute was?—In 1903 we were supplying under contract to the War Office nickel-steel air-vessel forgings, under War Office specification, of course, in which a certain chemical analysis is given. Our

own analysis showed that the composition of the steel was correct according to the specification, but on the steel being analysed by the War Department chemist he returned a higher quantity of manganese than was allowed by the specification. This was questioned, and a second analysis was made by the War Department chemist, his return again being above the limits of the specification. We questioned the methods adopted by the War Department chemist, from our own knowledge, stating that the method used was one that was liable to cause errors, and to prove our case we sent samples of the steel, which was supplied back to us from Woolwich, to the National Physical Laboratory, asking them to analyse by their own method and also by the same method that was adopted at Woolwich. This they did, and their figures coincided as nearly as possible with our own, allowing a reasonable chemical error. At the same time we sent similar samples of steel to another firm of analytical chemists, Messrs. Pattinson & Stead, of Middlesbrough, as a check analysis. Their figures also corresponded both with our own and with the National Physical Laboratory figures. Further correspondence took place between my firm and Woolwich, pointing these figures out, but the final decision insisted on by Woolwich was that the forgings should be rejected, as they fell back on a clause which exists in their specifications, stating that the decision of the War Office chemist must be final. Consequently 19 forgings were rejected on this chemical question.

1200. (*Chairman.*) Have you endeavoured to obtain from the Government a clause in your contracts providing that there shall be a reference in case of dispute ?—Yes, several times. On the 11th September, 1903, we wrote to Woolwich. This was in connection with the case I have just gone into. This is an extract from our letter : "With reference to the question of the decision as to chemical analyses by the Woolwich chemist, we would refer to our letter of December 31st, 1902, and again request that the clause in the specification relating to this point might be altered so that in case of a disputed analysis the matter may be referred to a third and independent analyst, whose decision shall be final." The reply to that was a reference to that clause in the specification governing the analytical test, the clause being that specimens of the steel shall be "forwarded to the Superintendent, Royal Gun Factory, Woolwich, for analytical test by the War Department chemist. In case the steel maker does not agree with the result obtained, a second test may be ordered, and upon this the decision of the War Department chemist as to the constituents of the material shall be final."

1201. That was the contract actually entered into in that particular case ?—Yes.

1202. But with regard to contracts about to be entered into, have you never attempted to secure a provision for reference ?—We have raised the same question several times. I would not be positive how many ; I should say four or five times, but the clause has invariably been insisted upon.

(*Sir Andrew Noble.*) I may interpolate and state that the question would have been raised by the War Office, but it was stopped by the National PhysicalLaboratory informing us that they could not do any tests.

1203. (*Chairman.*) But do you think that the Government, having refused to admit a reference test up to the present time, would consent if the proposed reference was to the National Physical Laboratory ?—My personal opinion is that they would. I know nothing as to the means to be adopted, but my personal opinion is that they would, for the reason that several firms supplying similar material have the same question at issue, the same question of differences in chemical analyses, and are suffering rejections from the same cause.

Mr. R. E. Spencer.

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1204. You refer us to a case of chemical tests in which there was a dispute between your firm and the Government. Have similar disputes arisen in regard to mechanical tests also ?—Yes. In August, 1903, a case arose where the mechanical tests obtained on our own testing machine from steel cut from similar forgings gave certain figures, and on the receipt of the same forgings at Woolwich test pieces were cut from them, and the figures given by those test pieces differed from our own. In that instance we sent sample pieces cut from the same forgings to the National Physical Laboratory, asking them to test them on their machine and inform us of the results. Their results were sent to us, and they coincided to within ·6 ton per square inch of our own breaking strain. But in that case also the decision of rejection was adhered to.

1205. Naturally, you would have no objection to the publication of such testing work by the National Physical Laboratory if it was undertaken ?—No, I think it would be advantageous, certainly, from a contractor's point of view.

1206. (*Sir John Wolfe-Barry.*) I take it your position is that it would be a public benefit to have some Court of Reference ?—Yes, to have some Court of Reference, preferably a Government establishment.

1207. And as contractors you would have confidence in the National Physical Laboratory ?—Oh, yes, undoubtedly.

1208. (*Mr. Crossley.*) You simply would like to have such tests made by them as a Court of Appeal. You do not advocate commercial testing ?—Well, that is a point, I think, that scarcely touches us, because we do our own. We merely require a Court of Appeal.

1209. (*Sir John Wolfe-Barry.*) But arising out of that last question, supposing the National Physical Laboratory were doing none of the same kind of work, would you then have confidence in them as being called in without any experience as a Court of Appeal ?—Yes, I think so, certainly, because their laboratory would be equipped with the most modern appliances ; they would use the most modern systems of chemical analysis.

1210. You are talking of chemical analysis ; I was talking of mechanical ?—It would depend, I think, on the testing machines that they employed.

1211. Would it not also depend upon those who worked the testing machines ?—Yes, but I understand the National Physical Laboratory are continually undertaking the work of breaking steel test pieces.

1212. Yes. It was on that basis that you said you would have confidence in them ?—Certainly.

1213. (*Mr. Chalmers.*) Your difficulty arises, I understand, in connection with contracts with Government ?—I think I may say entirely.

1214. You have not had any trouble in connection with other customers of Elswick ?—No.

1215. In your other contracts you would take the opinion of an outside referee ?—Yes. In many cases a clause exists that in case of disputes, whether chemical or mechanical, the matter shall be referred to a third independent party, whose decision shall be final, the costs of such reference being borne by the party who is proved to be wrong. That is I think, the ordinary commercial clause.

1216. Should you propose, if you got this arrangement made with the Government, to extend to non-Government transactions the reference to the National Physical Laboratory ?—No ; I think that in many cases it would be found that contracting firms who had placed orders with us would prefer to go to some recognised public analyst.

1217. They would prefer it, you think ?—I think so.

Mr. Hugh Erat Harrison called and examined.

Mr. H. E. Harrison.

1218. (*Chairman.*) You are a member of the Council of the Institution of Electrical Engineers, an Associate Member of the Institute of Civil Engineers, and a Fellow of the Chemical Society ?—Yes.

1219. You have also been Principal of the Electrical Standardizing Testing and Training Institution, Faraday House, ever since its foundation in 1889 ?—Yes.

1220. And it is on behalf of that institution that you are prepared to give evidence to-day ?—Yes.

1221. You say in your *précis* of evidence that no steps were taken by Faraday House to oppose the establishment of the National Physical Laboratory, because the directors of the Institution gathered it was not the intention of the Government to compete commercially for work which was already being properly carried out by existing institutions, and you proceed to give the evidence on which you base that ?—Yes.

1222. That evidence has been so fully put before us by

Mr. H. E. Harrison.

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numerous witnesses already that I think it is perhaps unnecessary to go into it, but we will take it for granted that you consider that the report of the Committee of 1898 was inconsistent with the work which is now being done in connection with the testing of materials by the Laboratory?—Yes. May I call attention to one point in the Report? At the end of paragraph 12 there is a reference to Kew, and there it states that thermometers, sextants, etc., were tested at Kew, and it is held, I know, that the work that is now being done at Teddington is simply an extension of such work, and that therefore under this clause it is entitled to carry out the work it is now doing. But I desire to call attention to this sentence: "Evidence was given of the beneficial effect which Kew has exerted on the watchmaking trade, and it is noteworthy that this is due to the introduction of tests for which there was little or no previous demand on the part of the trade." Now, Sir, Bushy House is not, so far as I am aware, introducing any tests for which there have been no demand up to the present, they are simply taking testing work from others, which is a very different thing from what Kew did, because it introduced an absolutely new system of tests, and therefore undoubtedly did do very great good to the trade.

1223. In your view it would be legitimate for the National Physical Laboratory to make commercial tests where there had been no previous demand for such tests; is that it?—Exactly.

1224. Would that apply to materials as well as to instruments?—I think so.

1225. Any applications to test material of a character not previously demanded would, you think, be legitimately undertaken by the Laboratory?—If it is to test the quality of some new material, or to test material in a new way, then I should say that would be legitimate work. But I think that, reading the sentence that I quoted in conjunction with what is stated elsewhere in the report, namely, that present businesses are not to be interfered with, this only is the way in which it should be interpreted.

1226. I think you wish to submit for comparison a copy of the Faraday House Testing Fees, dated December, 1905, with the corresponding portion of the pamphlet published by the National Physical Laboratory in June last year?—I have here the copy which was published in 1892, one of our very earliest, which shows that we were carrying on the work then.

1227. Perhaps you might put it in?—Certainly. Then there is another published in 1895, another in 1902, and then our last one in 1905. I will not say that Teddington's is exactly the same as ours, but the two are substantially the same. Speaking for my own work, the fees are also substantially the same.

1228. You do not complain of undercutting by the Laboratory, but as a matter of fact the Laboratory fees are about the same as yours?—Yes.

1229. So that they do compete with you?—The competition is great, and likely to be greater, from the fact that the tests from Teddington are largely regarded as tests guaranteed by the Government, and the Laboratory as managed by a Committee of the Royal Society so that any tests of theirs would naturally take precedence of and be considered of more value than the tests of any private individual.

1230. You refer to the advantage which has been taken in some instances by private firms, who use the Government certificate for purposes of advertisement?—Yes. Does not the question of company promotion come next, No. 13?

1231. Yes. Would not that be a special case of such action?—That I cannot say. The two cases I refer to are different. I have not got a copy of the prospectus, but I sent down to Somerset House to have it seen. This is an extract from page 2 of the prospectus of the Premier Accumulator Company, Limited: "The Premier Accumulators have recently been exhaustively tested by Dr. Glazebrook, the Director of the National Physical Laboratory (President of the Institution of Electrical Engineers). The tests, which were of the severest description extended over four months. They thoroughly demonstrated the solidity of the special paste and the ability of the accumulators to withstand abnormal rates of charges and discharge and yet attain the average efficiency of 92.5 per cent., which is much larger than that obtained by any other accumulator. A reprint of the article in the *Electrical Review* of 1906, embodying Dr. Glazebrook's report, is enclosed herewith. The original report is in the possession of the Premier Accumulator Company of Northampton, and can be inspected by anyone interested." That, Sir, appeared in the original prospectus, and no doubt assisted very materially to float the company. Then what I have here is a copy of their present price list of the accumulator, with the report. These two go together; they refer to the same company.

1232. Supposing you had given the Directors of the Premier Accumulator Company a certificate, do you think that it would have been legitimate on their part to use such a certificate in the same way as they have used the certificate of the Laboratory?—We generally ask what our certificate is for. But so far as the report is concerned I see no harm in such a report being published if it came from an ordinary consulting engineer. But I do object to it coming virtually, as it does, from the Royal Society as a body, and from an institution endowed by the Government.

1233. Would your Institution, before undertaking a series of tests, enquire for what purpose any certificate you might give would be used?—We frequently do, if we have reason to suspect that it is going to be used improperly.

1234. If you thought it was going to be used for the purposes for which the Directors of the Premier Accumulator Company have used the Laboratory Certificate, would you object?—No, I would not object to what has been done, if it had been done by an ordinary consulting engineer. I do not find fault with the report in itself, but I do object to a report being issued, so to speak, with the seal of the Government upon it, for company promotion purposes.

1235. Do you also object to its being used for trade advertisements?—I think it is inadvisable.

1236. In that case, supposing you suspected that any certificate given by your firm was to be used for the purpose of trade advertisement, would you refuse to make the investigations?—No.

1237. It is merely to the name of a Government Institution being used for such a purpose that you object?—I do not wish to imply that I, as an institution, am doing anything wrong, and, therefore, that the Government ought not to do it; I simply say that what may be right for me is not necessarily right for a Government Institution to do. That is my whole point. May I say something about 15, Sir?

1238. Yes, please?—This, I think, is rather a different case. It is, of course, a question of whether it is dignified for a National Laboratory to appear in such an advertisement as this. This advertisement is appearing weekly in the technical press (a copy is at the end of the proof), and the great thing in it is the "National Physical Laboratory." Then we have the "Lamp Guarantee." This is a copy of the "Lamp Guarantee." I would like to read the second page, I need not read the first, "The British Thomson Houston Company again took exception, and to support their contention, offered to supply three standard 240 volt B. T. H. Edison lamps of each C.P. for test by the National Physical Laboratory, provided a competitor who, it was understood, had agreed to this alternative guarantee of 775 hours at 3.9 watts per candle, would do likewise. This suggestion was accepted, and in due course the 18 sample lamps (nine selected by each maker) were received by the National Physical Laboratory and the test begun." I do not know whether the Committee of the National Physical Laboratory knew for what purpose those lamps were sent. I take it for granted they did not, but this is the objectionable feature in it. The lamps were tested, and although it says definitely in the report of the Committee that unless special permission is obtained not to have results published, they shall be published, yet they were not published. The lamps by the other maker, which are called A, did not come up to the requisite standard, and instead of these results being published they are kept secret. Now had the results found with lamps A been published, that would have been of value to the public by showing they were bad lamps, but you will notice that the Laboratory is not in this way protecting the public. If the results are bad they are concealed. Here is a sort of challenge thrown down by one trading concern to another, and owing to the fact that results are not always published a maker does not hesitate to send his lamps up to Teddington as he would send them to Faraday House. When we hand over a report it becomes the property of our clients, but we say either it must be published in full or not at all. That is our usual condition. Teddington is in a very different position.

1239. Do you think that as regards the question of publication the principle laid down by the report of the Committee of 1898 is sufficient and satisfactory ?—I think so, if interpreted as I submit it ought to be interpreted.

1240. As a general rule there would be no object to be gained in publishing the result of tests of materials, sample tests, for instance ?—I am unable to agree with you, sir. As I understand it the Laboratory was started—you know this report so well I need not quote from it—for the purpose of doing work which would be of national good, or, at all events, of use to a those sections of the nation who are engaged in certain industries. Therefore, the work which is undertaken should only be work of that character, and if it is undertaken at the national expense it certainly ought to be published.

1241. My question was this. Supposing that the National Physical Laboratory is permitted to undertake sample testing, do you think that in every case the results of that testing ought to be published ?—Unfortunately, I think they ought not to undertake them at all.

1242. I understand. It is a hypothetical question I am putting to you ?—I think that, so long as the Laboratory receives a grant from the Government, results ought to be published. If the Government stops its grant, and simply lets it compete on equal terms, then, I presume, it might do the business of an ordinary testing institution, but so long as these tests are carried out with public money they ought to be made public ; and, I say, it is promoting unfair competition with us private people to assist these by public money to do ordinary commercial tests which they are not bound to publish.

1243. Would you apply the same rule to testing which could hardly be described as commercial or routine testing, but partook more of the nature of investigation, yet was paid for by private individuals ?—Yes, certainly, and it says so specifically in your report.

1244. I think the Report leaves a discretion, does it not ?—May I read the passage. "The results of investigations undertaken at the request of private individuals should, except in special cases, to be approved beforehand by the Governing body, be published," etc., or be accessible. Now I do not know precisely what the original intention of that was, but there is the word "except," which means it is not to be the general rule. Yet the Committee chooses to "except" a very large number of cases indeed.

1245. I wanted to know whether you are of opinion that no exceptions should be made, or whether you think a certain amount of discretion should be left to the Executive Committee in such matters, which, I think, was the intention of those who signed the report ?—I cannot think, off-hand, of a case where they ought not to be published, but it is quite conceivable that such a case might arise, and then, I think, that the Governing body should, only after very careful consideration, not publish, or possibly defer publishing for some time. There might be cases of that sort, but what I do say is that this "except" should be the prominent word in this clause, and that it is not in a case like this, where an ordinary commercial test is carried out with Government funds, that publication should be withheld.

1246. Then I think you wish to call our attention to the harm that may be done to British industries by the issue of certificates of untrustworthy secondary standards ?—This is a case that has come under my notice, at Faraday House, and I think it is a very important case indeed. It shows that as the Laboratory is at present conducted it is being conducted on wrong principles. A statement was made by Dr. Glazebrook in *The Times* some time back, and has recently been repeated by Lord Rayleigh, who I believe is the Chairman of the Committee, that one very important reason for doing this commercial work is that the staff of the Laboratory may be properly trained for their work. Now I hold that the essence of the work (for my purpose the electrical work) is, after perhaps research work, the production or the verification of secondary standards. Probably, Sir, you are not familiar with what is done in the ordinary commercial testing of incandescent lamps. It is a very difficult thing to make uniform lamps: they differ widely. That being so, the lamps selected from batches are sent to us with the ordinary bayonet joint, they are put on the photometer, and are rapidly measured one after the other, and we get in that way a low degree of accuracy, but one which is within what the contractor wishes. A light standard has been a very great difficulty with all of us, and we thought that our position would be strengthened if we were able to say that we had a certificated standard from Teddington. We did not go direct to Teddington, but to the Ediswan Electric Light Company, who make a speciality of these lamps. This lamp, as you will notice, was examined not for us, but for the manufacturer, and I will just ask you, Sir, to look at that. (*Document handed in.*) Kindly look under the heading "Volts." You will see that the voltage is given to one in 9,900 odd, and the amperes to one in 6,600 odd. That you will notice will give, speaking roughly, a degree of accuracy up to about three in 10,000. Anyone receiving that standard would have a right to suppose that on applying the proper voltage, or applying the specified current, whichever way you put it (for the one is a function of the other, and therefore they are not really independent things), he would get a light within what it is specified to be within, say, five in 10,000, or something of that sort. Well, at a very early stage in our testing work we found that tremendous errors were introduced by these ordinary holders. If you take a set of lamps out of their holders and put them back again, sometimes you get the same light, but you may get a result as different as one per cent. That was known to us, and we have made the principle for the last ten years—when using these lamps for secondary standards—of soldering the connections. Many of our competitors say that that is unnecessary, and that an ordinary screw joint is good enough. That may be, but we are all agreed on this: that the bayonet socket joint is absolutely useless for a standard lamp. Now, Sir, that lamp was supplied to us with an ordinary bayonet socket joint, and had we not known something about standards we might have been sending out results not anything like as accurate as we should have thought: in fact I will go so far as to say that a lamp with a bayonet socket holder cannot be used as a secondary or even a tertiary standard. That is the direct outcome of training these men by ordinary commercial testing, and therefore I hold, apart from any question from the monetary point of view, that by letting men be trained in ordinary commercial methods you absolutely unfit them for the very work that Teddington has been established for. You will notice on that certificate there is not one word about its being liable to fault in the joint, or anything of that sort.

1247. You think that the giving of a certificate by the Laboratory for a standard glow lamp is quite within its proper functions ?—It is one of the things it is meant to do.

1248. What you complain of is that the work is badly done ?—Exactly: that they sent out as a secondary standard something that was no standard at all.

1249. But is it not rather a rash inference to regard that as the result of their doing commercial testing work ? In the first place, the amount of commercial testing work done has been very small: it could hardly be a vitiating cause to that extent ?—I rather wished to let the experimenter down easily, by implying that if what he was testing commercially, what he did was perfectly right. But, if he was not testing commercially, it means he did not know his business.

1250. (*Sir John Wolfe-Barry.*) The last instance rather seems to me to be an argument for fuller knowledge for what is wanted than anything else. You say the standard that he gave was not a sufficiently good standard to do ordinary testing by, I think ?—Yes: it is not a secondary standard.

1251. Therefore it appears to me that the argument, subject to what Dr. Glazebrook may say, is rather that this gentleman should have more training ?—Exactly: training in that kind of work. But this is an example of a case in which training in commercial testing is no use.

1252. When did you, who have been largely engaged in commercial testing, find out you wanted a standard of a more precise nature than one with a bayonet joint ?—It is common knowledge. It is not ourselves only that have found it out. There was a long discussion in some of the technical papers about it a year before this certificate was issued.

1253. Do you attach a mark on the lamps you test ?—They generally come to us marked.

1254. But I mean for efficiency ?—No. We send the client back a table with the lamps and their marks and the particulars that he wants opposite.

1255. Do you find there is a great difference of efficiency in these glow lamps ?—Oh, yes.

1256. Is not there a Committee now sitting on that subject of standardising ?—Yes, there is.

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1257. Are you on that?—No, I am not on that Committee. But I should like to say that would not apply to a standard lamp.

1258. No, the ordinary commercial lamp. There is a very large difference between the candle power marked on some lamps and what they really give?—That is frequently so.

1259. (*Mr. Crossley.*) You seem to think that a test should not be advertised if coming from the National Physical Laboratory?—Yes.

1260. Is not it the commonest thing in the world for the engineer or anybody bringing out a new engine, or a new pump, or a new anything, to get a professor from the University (or two or three professors usually) to come and test them thoroughly and give his opinion?—Yes.

1261. Then it is considered a very proper and honourable thing to advertise the best opinion you can get?—That is so.

1262. Why should there be any difference with a Government department?—My objection to that is that public money is being used for advertisement purposes.

1263. I assume the man would pay the full price. He is always willing to do that, and always does pay the fee charged by the Professor. There is no Government money there; you are paying the cost?—Exactly. If Teddington could run without a grant from the Government I presume it would.

1264. That does not mean it is always to run without a grant from the Government. There may be a scale which, calculated properly, would pay the full cost, and an overplus, perhaps, on the expenditure?—I will put my objection, apart from any question of fee, in another way. My objection to the Government seal being put upon anything which is to be used for advertisement is the same as my objection to the 1½d. stamp being put on patent medicines. To those who do not know, it gives the certificate, or report, or whatever it may be, a value which it does not really possess. Personally, when I get a certificate from Teddington I know its value, but the man in the street does not know it, and he assumes that it is something more trustworthy because it is impressed with the Government seal.

1265. You are talking about patent medicines now?—I am making a comparison. Just as the 1½d. stamp on the patent medicine gives it a value in the eyes of the public it does not possess, so does the seal at Teddington give the certificate issued by them a value which it does not necessarily possess. It gives it something more than the value of a test, which has been carried out by a much abler man.

1266. You are assuming that all these private places have very much more able men than a Government place?—I should say equally able men.

1267. You said abler just now?—Yes, for example in the case of the professors, who would make a special investigation for the report, they would be experts, and their report would naturally be more trustworthy than the report of the National Physical Laboratory which cannot have the first expert in every branch.

1268. You would deny that the National Physical Laboratory Professor would be the first expert, would you?—I should say the chances are he would not, and I base that statement on the very certificate I produce.

1269. I want to know why, when a nation pays for an Institution of this sort, the members of that nation may not, on paying a proper sum, use the Institution?—Because, when the Laboratory was started, the Treasury did not say we give you this grant in order that you may compete on more favourable terms with the businesses already existing, and we desire you to extinguish the businesses that now exist. The grant was not made for that purpose: it was made for something which was to be of national use. It is absurd to say that if a man wants a dozen ammeters tested for commercial purposes it is a national advantage for those to be done at Bushy House, or for the results to be published.

1270. (*Sir John Wolfe-Barry.*) Are you aware that the National Physical Laboratory is not wholly supported by Government?—Yes, and I also know that the grants which it receives from other institutions are likely to be withdrawn.

1271. We do not know about that: but that is the fact, is it not?—Yes. Originally it received a Government grant, I believe, and certain grants from various institutions.

1272. And manufacturers?—Yes, I believe so.

1273. Private individuals?—Yes, I believe so.

1274. (*Mr. Chalmers.*) Is your feeling one that the testing of samples is not a very important branch of the work, as hitherto carried on, of the Laboratory. Do you regard the testing of samples as being a not important branch of the Laboratory's work?—I am not quite sure what you mean by samples.

1275. Take lamps?—Then I say if it is a question of testing these lamps for ordinary commercial purposes, they should not be tested there.

1276. It is not an important branch?—It is very important.

1277. Unimportant as compared with research work?—Absolutely unimportant.

1278. Anything that would tend to diminish the importance of their research work, or diminish the amount of time and trouble they could give to it, I understand in your view would be rather a frittering away of the opportunities that they enjoy?—That is exactly my view.

1279. The Institution was founded for the purpose of doing that which could not be done at the time in 1898. It was to standardise and to carry on research in physical constants and so forth, was it not?—Yes.

1280. That is the work that I gather you think it should confine itself to?—Yes. I think that is stated plainly in the report. "It is rather to the improvement in the details of the method of making the determination that they think that the work of a public institution will for the most part be directed. This cannot usually be carried out by private investigators on account of the expense and the length of time over which the experiment must extend." I take it that that was the main purpose for which the Laboratory was founded for which the Government gave the grants, and the other institutions their subscriptions.

1281. That being the object with which it was founded, you are opposed to its frittering away its time and opportunities on testing glow lamps?—Yes.

1282. (*Sir Andrew Noble.*) Do you give a formal certificate with your lamps that you test?—Yes. The form is somewhat different from that I have produced.

1283. Very much the same as the National Physical Laboratory, is it not?—The details are somewhat different, but it is that kind of thing. We give mean horizontal candle power, and watts per candle. Then we give the pressure, which is kept constant within one per cent. That is the kind of thing that we give. As a matter of fact, we give the particulars for which we are asked. All contractors do not want the same particulars.

1284. You could send a copy of one of your certificates, could you?—Certainly. If you do not mind, I will cross out the name of the person for whom the test has been carried out.

1285. Yes, certainly. It will be information you do give?—Exactly.

1286. (*Sir John Wolfe-Barry.*) Am I right in assuming that there is no means now of the public finding out what standard lamp they are really receiving when they buy a marketable article, except the maker's name?—They can either test it themselves or they can send it to an institution like ourselves.

1287. Yes, but I mean, without having the expense of testing, there is nothing for glow lamps equivalent to what is done on the clinical thermometers by the Kew Observatory?—No, nor would it be possible.

1288. At any rate, whether it is possible or not, it is not done, is it?—No, but it can be done if the people are prepared to go to the expense.

1289. Yes, but it is not done at present?—No; generally we will say that the lamps are taken in batches, and then the contractor takes one in ten, one in 100, or whatever he pleases, and sends them to be tested.

1290. Where does he send them to?—He sends them to Faraday House, amongst other places.

1291. Then do you mark them?—No. There is the mark on the lamp which is the contractor's or the maker's mark, we give a table of results, but we do not actually engrave anything on the lamp itself.

1292. Nothing like the mark of the Kew Observatory?—No. We have never been asked for that.

1293. Do you think it would be a very valuable thing for the public?—We have never been asked for it.

1294. No, but do you think it would be a valuable thing for the public ?—I think it would be a good thing for the public.

1295. Is not that one of the things that is now being discussed, to have some standardising authority for glow lamps ?—That I do not know.

1296. It is of enormous interest nowadays ?—Yes.

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Sir JOSEPH SWAN, F.R.S., called and examined.

1297. (*Chairman.*) I think you wish to give the Committee your views on the question that arises when a private individual or firm asks the National Physical Laboratory to undertake an investigation and offers to pay for the expense of that investigation ?—Yes.

1298. What you desire to lay before the Committee is your views as to whether in such cases publication should or should not be made compulsory ?—That is one of the points.

1299. Would you give us your view as to that ?—I have written what I thought would be best to say. I will read it, if you please. Shall I, in the first place, speak with reference to the question of interference with other agencies?

1300. If you please. I have not received a *précis* of your evidence containing any reference to that.—Perhaps not. I did not know that it was necessary that I should adhere very strictly to that.

1301. No. Perhaps you will make your own statement independently ?—With reference to the question of interference with other agencies, may I say I think the rule already laid down, that chemical analysis, pure and simple, is outside the scope of the Laboratory's operations, is a good one and ought to be not only literally adhered to, but construed so as to minimise the danger of unfair and annoying competition between the National Physical Laboratory and professional analysts, whose goodwill and co-operation are much to be desired on every account. As of necessity the legitimate work of the National Physical Laboratory must often touch on the field occupied by the professional analyst, I suggest as a further safeguard against collisions with other agencies that where, as an incident in any inquiry or test undertaken by the National Physical Laboratory, work is done that is comparable in any respect with that ordinarily done by the analytical chemist, the charge made by the National Physical Laboratory for that part of the enquiry should be on a scale higher than that generally adopted by analytical chemists.

1302. Do you think that would be practically sufficient to meet the grievance of the analytical chemists ?—I do not feel quite confident as to that. I think there is a liability to encroachment to some extent upon the domain of the analytical chemist, and that it is difficult to avoid encroachment. So that when you ask me if I think this would satisfy them, I am not able to say that I am quite confident it would satisfy them. I think it would be a contribution in that direction, however.

1303. Without going so far as to say that it would satisfy them, do you think it would satisfy what is reasonable in their objections ?—Yes, I do. I think that with care in the application of the rule which is already laid down, that analytical work such as commercial analysts undertake should not be undertaken, and that, where analysis is done, it should be merely an incident in a wider investigation of a character quite foreign to the work of the ordinary analytical chemist, that rule, if it is properly applied, if it is construed as I suggest it should be construed, with a view to avoid collisions, I think, goes a long way towards conciliation.

1304. With a real anxiety to prevent undue and unfair competition ?—Yes. A great deal depends upon how that rule is administered ; how it is applied ; how it is read ; whether literally or in the spirit of it, if the object of it is, as I take it the object is, to obtain harmony between the National Physical Laboratory and the profession of analytical chemists.

1305. Would you, while recognising that it is difficult, if not impossible, and perhaps also undesirable, to prevent the National Physical Laboratory from undertaking work that does come into competition with private enterprise, urge that where that is done care should be taken that very full fees are charged, and also that the general rule of the National Physical Laboratory to avoid unnecessary interference with the province of private enterprise should be most carefully observed ? Would that represent your views ?—I think, very nearly. I would rather say that I think it is almost impossible to avoid points of contact with the work of the ordinary analytical chemist, and possible grievances or imagined grievances, and that one of the best means I know to avoid actual grievances would be to construe that rule very carefully in the sense of avoiding all reasonable cause of ill-will, because I think it is most desirable that ill-will between the profession of the analytical chemist and the Laboratory should be put aside, and that there should be not merely harmony between them, but co-operation. I think the National Physical Laboratory can be of use to the analytical chemist, and the analytical chemist can be of use to the National Physical Laboratory, if there is good-will between them.

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1306. Holding that view, you would, I suppose, consider that the actual practice of the Laboratory is better left to the discretion of a body like the Executive Committee ?—Certainly I would ; very largely.

1307. It is better to leave it to their discretion than to lay down any absolutely rigid rules ?—I think so.

1308. Does that exhaust what you want to say upon that point ?—On that point, yes. Then I go on to say that to make the National Physical Laboratory of the greatest possible use in promoting progress and improvements in manufactures where questions arise of the physical fitness of materials used or proposed to be used in them, I believe it is desirable to somewhat extend the scope of its operations beyond the limits within which they have hitherto been confined, and I believe it is possible to do this without any undue interference with other agencies, which I take chiefly to mean the business of professional analytical chemists. These are the agencies which I think are probably referred to in the reference.

1309. In what direction would you suggest that the scope of the Laboratory should be enlarged ?—To illustrate what I mean, perhaps I may refer to the correspondence which passed between the Director and myself about a year ago. That correspondence raised the question whether the National Physical Laboratory would, on suitable conditions as to cost and as to publicity, undertake for me a research into the physical properties of certain substances as to which there was very little trustworthy information then obtainable. The kind of research described was chiefly concerned with the mechanical, electrical and thermal characteristics of certain bodies, and was almost wholly outside the scope of the ordinary work of the analytical chemist. It was, indeed, original research work, to ascertain the physical characteristics of some bodies whose physical characteristics were as yet not fully known. It goes without saying that I did not propose to have this work done at anybody's cost but my own, and I may add that I had myself been working on the same subject in my own laboratory, but found the field too wide, and the appliances needful for successful work often beyond the experimental resources at my disposal. Seeing how well equipped with electrical and mechanical appliances the National Physical Laboratory was, and how close some of its work was to that I required to have done, the thought naturally occurred to me to obtain its assistance if the Executive Committee adjudged it to be a proper proposal. It seemed to be a case in which the National Physical Laboratory might be a means of settling some moot-points as to the true physical properties of certain bodies, with possible and even probable industrial advantage, which would either immediately or ultimately benefit the general public. Unquestionably there are difficulties in the way of reconciling the different interests involved, the general interest and the individual interest. But I do not think these are irreconcilable. New knowledge is a precious commodity, and if, through the co-operation of the National Physical Laboratory and the initiator and cost-bearer of an investigation, new knowledge applicable to industrial improvement is attained, then, if the new knowledge either immediately or ultimately becomes public property, the public is undoubtedly a gainer through this co-operation. As to publication, it is, I admit, a nice point, but I may say that I think it would not be an undue recognition of

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public services rendered by initiating, assisting in and paying the full cost of the supposed investigation, to give the initiator the option of withholding for a short time, say seven years, such portion of the results of a research of the kind supposed as he might think proper to withhold from immediate publication.

1310. What was the answer of the Laboratory in the particular case you have in your mind ?—Has the correspondence not already been laid before the Committee ?

1311. I do not think it has.—I have brought it with me.

1312. We need not go into it at length, I think, Sir Joseph ; you might give us the general purport of it.—I may tell you then that the first answer was favourable. It was, I believe, very carefully deliberated; that is to say, there was not an immediate answer given, but it was brought before the Executive Committee, and after some time an answer favourable to my proposal was given : they could undertake this work ; they saw no objection to its being undertaken. I have assumed here that the whole thing was personal, but as a matter of fact it was not quite so, and I had to consult some colleagues as to expenses and the general scheme, because, although it originated entirely with myself, it was a new proposal to my colleagues, and when this point was reached, it was necessary to consult them. It happened that they did not look favourably upon it, and therefore the whole matter was thrown back upon me personally, and some delay occurred through this. I still felt that I would like the work to be gone on with on my personal account. But finally, when I proposed that it should be gone on with, or a portion of it should be gone on with, on my personal account, then, I think, questions such as you are debating now had already been raised, and it was thought better to halt, and therefore there was a drawing back from what was originally agreed to.

1313. That is to say that they had originally agreed to carry out these investigations and keep the results temporarily secret ?—Yes.

1314. And ultimately they said that was a condition they could not carry out ?—No ; that point was not specifically raised at all, but the whole question was answered negatively finally ; that is to say, the assent at first given to it was withdrawn without entering into particulars as to which point it was that led to the change of view.

1315. (*Sir John Wolfe-Barry.*) Was that after the nomination of this Committee, or about the time of the nomination of this Committee ?—It is nearly a year ago.

1316. Yes, I think that is when the correspondence first began. I happen to recollect something about it. I was on the Executive Committee, and I happen to recollect that the matter was discussed, and as it was a subject which was probably going to be debated in connection with the objections I think the decision of the Executive Committee was not to refuse it, but to hold it over ?—I think that is perhaps more correct, and that the question is in suspense now.

1317 (*Chairman.*) Would the question of publication have been an important one in influencing you to ask or not to ask the National Physical Laboratory to undertake this investigation ?—If the investigation were carried on as it would be now, on my personal account, I might not make it an imperative point. But I think it is an important point, and one which would influence me in making use, or not making use, of the National Physical Laboratory.

1318. You think that cases might easily arise in which important investigations might be carried out at the request of private individuals or firms, and at their expense, by the National Physical Laboratory, which would be allowed to drop through altogether, if there was no promise of temporary secrecy ?—I think so. I have no doubt about that ; that is to say I think it extremely unlikely that a business firm, aiming to work out improvements in their manufactures, would go to any large expense in the discovery of new processes or methods, with the condition hanging over them that what is discovered becomes public property immediately, and that they have no personal and preferential benefit from it whatever in compensation for the expenses they have gone to, and not only in compensation for the expenses they have gone to, but in compensation for the initiation of original ideas contained in the research.

1319. That suggests a further point to me on which I should like your opinion. Is it not possible that you, or somebody in the same position as yourself, might come to the National Physical Laboratory with an investigation half carried out ?—Quite.

1320. You might be unable to pursue it, because you have not the requisite apparatus and so forth at your command ?—In fact that does describe very nearly my actual case.

1321. But, on the other hand, you are very desirous that the further progress of the investigation should be carried out under the auspices of the National Physical Laboratory. If, then, one of the conditions was immediate publication, they might be disclosing not merely some fact discovered by themselves, but your own previous discoveries ?—Yes, there would be imminent danger of disclosure of matters that really had not originated with the National Physical Laboratory, but that had originated separately from them.

1322. I suppose you would be content to leave the question whether publication should or should not be insisted upon to the discretion of the Executive Committee ? I do not see in what other way it would be possible to arrange.

(*Sir John Wolfe-Barry.*) You mean as a condition precedent ?

(*Chairman.*) Yes.

(*Sir Andrew Noble.*) The number of years that it should remain unpublished.

1323. (*Chairman.*) The question whether there should be any publication or deferred publication ?—I think it is more a question of how much should be published and what should be published, because there are many things that the Laboratory themselves would not in any case want to publish, I mean trivial things, things not of sufficient importance for publication. There will always be selection in the matter of publication, and it is just on the point of selection whether there might be some reservation of particular points, very important to the persons who are paying the expenses and have initiated the inquiry, but not, perhaps, of equal importance to the general public.

1324. There would be no way of providing for that except by leaving it to the discretion of the Executive Committee or of some authority ?—Well, I think it might be a joint matter of agreement between the Executive Committee and the person putting the research into the hands of the National Physical Laboratory. I mean they might consider together whether there was any, and, if any, what portion of the research that might be reserved at the discretion of the person putting the research into their hands. I think it could not be left entirely to the committee.

1325. Some previous arrangement would have to be entered into before the investigation by the Laboratory was commenced ?—Yes. Of course there would have to be some agreement.

1326. But you would have to leave it to the Executive Committee to determine whether it was proper to enter into any such an agreement, and, if proper, what the terms of the agreement should be ?—Yes, certainly. But on the point of publication I think the only practicable way of dealing with it is to place it within the discretion of the person who has initiated the investigation how much of the research shall be published and how much withheld. I do not think that on any other conditions you would be likely to get use made of the National Physical Laboratory in a good many cases where secrecy for a time was the only means of getting any financial return from the investigation. But, speaking generally, I would allow the National Physical Laboratory to publish everything ultimately after a certain interval of time.

1327. (*Sir Andrew Noble.*) Might not there in some cases be an objection to indicating what the research was, on account of setting other people to investigate the same subject ?—Yes.

(*Chairman.*) On the other side, the difficulty might arise, if more than one person was following a particular trail and one of them was the first to ask the National Physical Laboratory to undertake further investigation, and the National Physical Laboratory consented with an undertaking that there should be secrecy for a time. In that way you would be actually placing the other investigator at a disadvantage.

(*Sir Andrew Noble.*) But if there had been no communication, then the other person would have a right

also. My point was that you might set a person to think of it by publishing a result. If it were independent, I think the National Physical Laboratory would have to do it for both.

1328. (*Chairman.*) Does not that introduce a difficulty? Suppose A has followed up an investigation to a certain point, and then asks the National Physical Laboratory to take it up, B has also on his own account been following that investigation and subsequently comes to the National Physical Laboratory. What answer has the National Physical Laboratory to give to B?—I think it would be quite in order.

1329. (*Sir Andrew Noble.*) Do you think they would do both, or refuse?—I think very much depends upon precisely what it was that he asked to be done, and I do not think you can deal with the matter quite in the abstract form in which we are discussing it now.

1330. Perhaps the solution will be to refer to the Executive Committee?—I think the Executive Committee could do a good deal.

1331. (*Sir John Wolfe-Barry.*) I should like to ask whether seven years does not appear to you to be rather a long period to keep things from publication, assuming that this is an exceptional matter and that the ordinary routine would be publication. Does not seven years strike you as rather a long time?—No, it does not.

(*Sir Andrew Noble.*) You have a patent for 14 years.

1332. (*Sir John Wolfe-Barry.*) Yes, but it does not prevent your patenting. Anybody could secure their rights in much less than seven years?—You suggest that patenting does get over the difficulty to a great extent?

1333. Yes, that is what I mean, and that might be very well got over by, I should think, a period of one or two years?—Yes, possibly. I do not adhere tenaciously to a seven years' limit.

1334. (*Mr. Crossley.*) But do not you think that if a man wanted a series of very important experiments carried out, for which he was going to pay a liberal sum, he would have a right to specify that the property would be his entirely, absolutely and for ever? Is there anything unreasonable in that?—I think that initiating and paying for an investigation such as we are supposing is really doing a considerable public service, and that immediate complete publication might involve a sacrifice of the nature which you suggest by your question.

1335. Do not you think that in making the terms for the investigation it should be left to the man who is giving the order for these investigations to say when publication should take place: he should be the person to settle it?—Yes, I think it should be entirely within his discretion what should be published, and when, if ever, it should be published.

1336. (*Sir Andrew Noble.*) You think that not less than seven years should be named; but has the thought occurred to you that in certain of these investigations it would be in the power of the person who desires the investigation to patent?—It might or might not be possible to obtain protection in that way; there are some things you cannot patent.

1337. But your view is that in the case where they cannot patent it should not be disclosed in less than seven years?—Yes, I think it would be a reasonable space of time, during which publication might be withheld.

1338. There would be no restriction, I suppose, against a person, paying the full expenses, patenting after the investigation was completed?—I am supposing that.

Sir ARTHUR RÜCKER, F.R.S., called and examined.

1339. (*Chairman.*) You were a member, I think, of the Committee of 1898?—Yes, I was.

1340. And, in fact, in Lord Rayleigh's absence you acted as Chairman of that Committee?—Yes, I did.

1341. Would you kindly give us your views as to the meaning of certain disputed points in the report of the Committee of 1898?—I should be very glad.

1342. A doubt exists as to whether the intention of the Committee of 1898 was to permit ordinary routine commercial testing, or to forbid it?—I do not think it was intended to encourage it on a large scale.

1343. You think the matter was deliberately left more or less open by the Committee?—Yes, that is my impression.

1344. Do you think they considered it impossible to lay down any rigid and definite rule upon the subject?—I think they thought that experience of working the thing would be wanted before they could lay down any absolutely rigid system.

1345. Are you a member of the Executive Committee now?—Yes, I am, but I am sorry to say that for the last four or five years I have had very little to do with it.

1346. So that you are not in a position to benefit by the experience which has been gained since the Laboratory was started?—Not very much, no.

1347. In order to prevent undue interference with the sphere of private enterprise, is there any suggestion which you would be prepared to lay before us?—I should have thought that the difficulty might have been got over by placing the fees charged to private clients by the Laboratory at something above those charged by the ordinary commercial world.

1348. You think that would sufficiently meet the difficulty?—Yes, as far as I am able to judge.

1349. And the complaints of analysts and testers, so far as those complaints are reasonable?—I think so. If I may say so, I think there can be no question that the Laboratory should be open to a Government Department to use perfectly freely. The Government largely supports it, and I cannot imagine any objection to Government work being sent there. As regards the ordinary, what I may call commercial testing, it was clearly our view, and a view which I still hold, that we were not to enter into direct rivalry with the ordinary commercial testers, if I may use that phrase. But, on the other hand, I do not think it was intended that the Laboratory should be shut to those who wished to use it for commercial purposes. The best way I can think of drawing a distinction between the purposes for which it may or may not be used is the question whether the person who desires to use it thinks the occasion so specially important that he is willing to pay more than if he went to an ordinary distinguished tester.

1350. You would hold that view even in a case of what might be described as the commercial testing of samples?—Yes. I think we put in some special phrase that it was to be special and important cases it was to be used for.

1351. That would rather imply that in your view ordinary or routine commercial testing should be excluded?—I think it is conceivable that a difficulty might arise as to what is ordinary commercial testing. I mean the case might be such that to the person engaged it was not an ordinary matter, but one in which we will say so much money was involved, or the necessity for accuracy was so great, that he did not regard it as an ordinary case. These are the words in the report: "But there are many special and important tests and investigations into the strength and behaviour of materials which might be conducted with great advantage at a laboratory such as is contemplated in the reference." It was that I was referring to, and I think that between the two alternatives of absolutely refusing to do any commercial work on any terms, which I think in the case of a national institution would be a very difficult line to take up, or to say that all commercial testing would be taken quite indifferently, which, again, is not the view of the Committee, it seems to me the best view is as to the speciality and importance of the occasion, whether the person desiring to use the Laboratory regards it himself as so special and so important that he is willing to pay more than the market value for the tests.

1352. (*Mr. Chalmers.*) And that would be subject also to those previous words?—"It would neither be necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories."

1353. But it would be research, not testing of samples?—I would go beyond that. If I may say so, there is one example that I think I may give to the Committee. I was for many years Professor to the Royal College of Science,

Sir A. Ricker.

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which is a Government institution, and the cry was raised, before I was there, that here was the Government paying for an institution which was competing with privately conducted institutions such as University College and King's College, and there was the question raised, which is exactly similar, I think, to this in ethics, as to whether or no it was right for the Government to compete with these private institutions. The difficulty was met there by putting the fees of the Royal College of Science at some point considerably above those at the other institutions. The consequence was that during the whole of the fifteen years I was Professor there was never a whisper of any difficulty between the two.

1354. (*Chairman.*) The difficulty was in your case effectively met by increased fees ?—By increased fees, yes.

1355. By how much did you increase the fees over those usually charged ?—The whole thing was done before I was there, and I am not able to give you a definite answer to that. I should guess that it would be something of the order of 20 per cent. ; but that is a guess.

1356. Then, on the question of compulsory publication, would you like to offer any views ?—I have not heard of any difficulty arising on that account, and I cannot say I have given any special attention to that question lately.

1357. (*Sir Andrew Noble.*) You mean publication for what is altogether privately paid for ?—Yes.

1358. Supposing, for example, my firm came to the National Physical Laboratory and said, "We want to carry out this investigation and we will pay the whole cost of it," in your opinion should that be published immediately, without the consent of the party who pays for it, or should it be retained for a certain number of years before publication ?—As I say, I have heard of no difficulty about that, and I have not given my attention to it quite lately. But I am sure we said something about it in the report. I should like just to look at that before answering.

1359. (*Chairman.*) Will you look at page six of the report, paragraph 24 ?—Yes. I think I would adhere to our report, that as a general rule it would be desirable the things should be published, but that in special cases, to be approved beforehand by the governing body, they need not be published. I think I would adhere to that. That seems to me to be the reasonable arrangement.

1360. (*Sir John Wolfe-Barry.*) I think you studied what was done at the Reichsanstalt, did you not ?—Yes, I did.

1361. Could you tell us what the custom is there, as to publication, first of all ?—My recollection is that there is no absolute condition against publication there. But this is some years ago.

1362. There is no enjoinder that there must be publication ?—My recollection is so.

1363. But you are not quite certain ?—No, I have not looked into it lately.

1364. Do you know also whether at that institution in Germany they undertake what is called commercial testing ?—I believe they do, within limits. I am very sorry, but I did not know this would arise, or I would have looked it up.

1365. Your memory does not quite serve you upon that ?—It does not quite serve me.

1366. (*Mr. Crossley.*) Would you say you would forbid a man to stipulate that if he paid for the whole cost of investigation it should be kept absolutely secret ?—I think I would leave it to the governing body. I think so many difficult cases might arise that if a cut and dried rule were laid down it might be very difficult to adhere to it in all cases without injustice. I think I should leave it to the governing body to say. If the man who paid gave sufficient reasons for keeping it secret I should allow it to be kept secret.

1367. Do you think that a man would give work of that kind to a laboratory involving a good deal of expense and at the same time involving that it should be published ?—I do admit it would cut that part of the work down, but, on the other hand, I say there is a good deal of difficulty in doing justice on the one hand to the outside trade, and on the other hand justice to the client.

1368. What have the outside trade to do with what is done by the National Physical Laboratory ?—We went carefully into that, and our view was that for the Government to endow this institution and allow unrestricted competition between an endowed institution and the ordinary trader was not, perhaps, quite a healthy state of things. But, as I pointed out, we were willing to allow a considerable latitude in the case where the governing body considered that latitude was desirable.

1369. I am asking where the man is willing to pay the whole expense ?—I think it might get a public institution into some little difficulty if it were the depository of a number of trade secrets for an indefinite time. I do think there might be some difficulty in that. Of course, I have never had anything to do with that kind of work myself, and I speak only as a private individual, but I do think that to bind up for an indefinite time trade secrets in a public institution of this sort might be open to some objection.

1370. (*Mr. Chalmers.*) The Committee of 1898 sprang from, I think, a deputation at which you were spokesman in 1897 ?—Yes, that was so.

1371. What were the main lines on which you approached the Prime Minister of the day ?—This is, I think, a copy of our memorandum. We spoke of the observation of natural phenomena, the study of which must be prolonged through periods of time longer than the average duration of life ; the testing and verification of instruments for physical investigation and the preservation of standards for reference ; and the systematic accurate determination of physical constants, and numerical data which may be useful either for scientific or industrial purposes. So that we clearly contemplated this Institution being useful to industry.

1372. In fact its specific object was that it should be useful to industry and to science ?—Yes.

1373. But it was the inauguration of an establishment or an institution which did not exist at the time and for which there was a distinct need ?—There was a great need for it. Some of the work done by the Kew Observatory has been quite easily incorporated, but that was the only work of the kind.

1374. The sort of work that private people could not do, which was too expensive and took too long, and so forth, but which was in the interests of science applicable to industry ?—Yes, science applicable to industry ; and I think pure science also.

1375. Should I be right in thinking the object was not to test samples ? That was not the object which led you and the other physicists to approach the Prime Minister ?—That was not the primary object.

1376. That was not mentioned at all, was it ?—I think that was mentioned under the head of "Useful to Industry," but upon that point I do not think we, on bringing the matter to the Prime Minister, had thought the question out as fully as some of us were afterwards able to do before the Committee.

1377. Anyhow, whether it had been thought out or not, was the object to supply a want for which there was no provision in this country in having an organisation to extend the bounds of human knowledge ?—Of course to extend the bounds of human knowledge ; but in that sense the determination of an unknown constant is extending the bounds of human knowledge.

1378. We call that research. That is what I want to suggest to you, that the object was rather research—to define knowledge more exactly ?—That was, no doubt, one of the main objects.

1379. It was not to test an incandescent lamp. That was not the object that led you and the other physicists to approach the Prime Minister ?—That was not the main object.

1380. Did you mention it at all ? Had you got in your mind at the moment that you would have a glow lamp tested ? Would that have been the object which would have led you and the many distinguished physicists to approach the Prime Minister ?—I do not think that a mere piece of ordinary testing work was in our minds, but that, where the determination of a physical constant is a matter of considerable importance, it might be done.

1381. That might be called research ?—Yes, but it might be research undertaken on behalf of a firm.

1382. But it is not the same thing as testing a sample where the question is simply whether the thing is or not within a specification ?—No. As I tell you, my own personal view is it is very difficult to distinguish between what is called testing a sample and what is research. I have no doubt testing a sample of iron, which is a matter of everyday work, is a matter of routine which may be done in various places, but it may be that some firm thinks it has devised some new material on which it wants the best information available.

1383. But that is not what we call testing a sample ?—No. Then we are agreed.

1384. The main object you would feel then and now

has been to add to knowledge and to research ?—To add to knowledge, but I may say, as distinguished from a good deal of work at the Royal Society, it is to add to knowledge from the point of view of the immediate utility to mankind at large, which is not necessarily the case in investigations by the Royal Society. Here it was intended to be knowledge of which we could see the use.

1385. And it was work which lay outside the range of that possible either to the individual or to the great teaching universities and colleges ?—A great deal of it was.

1386. So far as you are engaged in testing incandescent lamps, or in seeing whether steel is up to specification, so far the work of the institution must be diverted, must it not, from the research work and the investigations which were the primary and perhaps the sole object mentioned in 1897 ?—I do not think that necessarily follows, because if, as has been suggested, the payment is adequate, if it really covers all the cost, including the salaries of all the persons engaged, then I do not think it would be diverting the work.

1387. Supposing you are the head of the department and take some part in this work, it takes up some part of your time and leads you from the higher to the lower to some extent ?—In so far as there is a limit to all human effort, that is true.

1388. To the extent that you are suddenly called on in respect of commercial samples, which must be done quickly, because time is of the essence of commercial work, it will take you off research work ?—Yes. It has been contended, of course, that commercial work is useful as tending to train the staff.

1389. At whose expense ?—I should think it ought to be, as I have already said, 15 or 20 per cent. higher.

1390. Who pays for the training of the staff ? Is it the customer who has to pay the 15 to 20 per cent. higher fees in order to train the staff ?—I think so.

1391. Is that likely to attract a large body of customers for the privilege of training the staff ?—No, but we must take it one with the other. Of course I do not assume the whole staff will be ignorant and will be trained simultaneously, but there might be people in the lower parts of the work who were being trained for the higher.

1392. But perhaps there would be a general agreement that the testing of samples is not a very important business ; the real business is the research work and the investigation ? —Yes. That I should take to be the essential work.

1393. (*Sir Andrew Noble.*) My questions have chiefly reference to that point of the investigator who is ready to pay. I suppose, if the question were to go before the Executive Board as to whether publication would be allowed or not, that would be decided beforehand ?—I think so.

1394. You would have to have it decided beforehand ? —Yes, I think you would.

1395. And if you decided for immediate publication do you consider that many people would come if they did not want the results published immediately ?—No, I do not think they would.

1396. I take it merely as an instance, but I happen to be a member of the Board of Research of the Government, and we are all sworn that nothing shall ever be told of what we come to. Now if, for example, I or somebody came, and were ready to pay for an investigation which would take a considerable time, would you consider it desirable that the results for which the investigator pays in full should be made public immediately ?—What I should say would be that the governing body ought to consider the matter first, and they might arrive at a *prima facie* decision, but that if in the course of investigation facts came to their knowledge with regard to the work which they then know, which would help them to arrive at a diametrically opposite conclusion if they had known that to begin with, then I think they ought to have a right to revise their opinion.

1397. There are other questions which might arise if, for example, someone wanted some experiments in material for which the National Physical Laboratory is or will be well equipped ; in that case, if an investigator is prepared to pay for a number of expensive experiments, do you think it would be fair that the results should be published immediately without his consent ?—No, I think the governing body would in such a case probably decide that they should not be published.

1398. (*Sir John Wolfe-Barry.*) As Mr. Chalmers has asked you what was said to the Prime Minister and you have answered the question, I should like just to refer you to the Treasury Minute under which the Committee was appointed, of which you and Mr. Chalmers and I were members. I think you will see that towards the end of the Minute it says "That the Committee are to report whether the work of such an institution, if established, could be associated with any testing or standardising work already performed wholly or partly at the public cost."—Yes.

1399. So that it was not merely that the words "industrial purposes" justified something more than scientific research, but that we were asked to report how far this institution could be associated with any testing or standardising work already performed wholly or partly at the public cost ?—That is so.

1400. Those were the conditions under which the Committee reported, and to which you say you still adhere ? —Yes.

1401. (*Mr. Chalmers.*) What was being done at the moment ? Was there testing of anything more than thermometers and clocks ?—Yes, I think this had reference to the Board of Trade Standardising Office, and further to the weights and measures.

1402. And no decision was come to in the way of taking that over ?—No.

1403. But as a matter of fact the work that the National Physical Laboratory does do is what we call the Kew work ? —Yes.

1404. And that was not the testing of materials, or samples, or anything ; that was standardising instruments ?—It has been so chiefly.

(*Sir John Wolfe-Barry.*) But a great deal of testing work was being done by the Government at this time ?

(*Mr. Chalmers.*) Yes, but the work taken over was the testing of instruments.

(*Sir John Wolfe-Barry.*) And standardising work already performed wholly or partly at the public cost ?

(*Mr. Chalmers.*) That was not taken over.

(*Sir John Wolfe-Barry.*) They have taken it over for the Admiralty and the War Office, and for the India Office.

(*Mr. Chalmers.*) The work which was taken over, I think, was to a great extent that which had been done at Kew. It had a reference to Kew and the work which was taken over by Major Cardew.

(*Witness.*) Yes, but that was not Kew. That was the Board of Trade Standardising Office. I think also the question of the Weights and Measures Office was included.

1405. And what was the conclusion of the Committee as regards taking over the Weights and Measures Office ?—They decided to leave it alone.

1406. The work actually taken over by the National Physical Laboratory has been, therefore, the standardising of certain instruments, which are mainly thermometers and clocks ?—I should venture to put it a little differently, that is to say, we were asked as to whether or no the work of the National Physical Laboratory could be associated with these different institutions, and we decided at the time that we had better keep these institutions, but that did not mean that the National Physical Laboratory should not do work, not identical, but similar to what they were doing. I do not think it rules out the type of work, but I think it rules out the work undertaken by these Institutions.

Sir ALEXANDER KENNEDY, F.R.S., called and examined.

Sir A. Kennedy.

June, 1907

1407. (*Chairman.*) You are President of the Institution of Civil Engineers ?—Yes.

1408. I think that Institution is the largest subscriber, outside of the Government, to the National Physical Laboratory ?—It has subscribed £500 three or four times, I am not certain which.

1409. I think ever since 1902 it has subscribed £500 a year ?—Perhaps five times, then.

1410. We were anxious to know, having regard to the interest which the Institution takes in the National Physical Laboratory, whether you desired to make any criticisms upon the work that is now carried on there. Of course, you are aware that complaints have been made that it interferes unduly with private agencies. Do you agree with that criticism ?—I have had some talk with Dr. Glazebrook about it, and I am afraid that I do agree with that. We have had a talk about it once or twice. The point was raised at the general meeting, and I quieted things down. Some gentlemen at the meeting spoke about the subscription of £500, and I said that there was not at that moment any application for a further subscription, and therefore the matter did not arise, but this Institution would subscribe, of course, with the intention and with the knowledge that the National Physical Laboratory was a scientific institution, and that seemed to please the people who were there. I fancy there had been a good deal of talk about it amo gst them. At any rate there was a good deal of applause at that, and nothing more was said. Of course, I did not want to raise a discussion about it.

1411. But you have not looked at the matter very closely yourself ?—I have had it brought before me, and I thought the better way was to talk to Dr. Glazebrook about it. I am afraid we do not see quite eye to eye. He thinks it is quite right to carry on work which appears to me to be purely commercial, and which I very much regret he should be carrying on. That is in addition, of course, to the most valuable scientific work which has been done at the Laboratory, and which is being done, and of which we have had the benefit, and which the Mechanical Engineers have had the benefit of.

1412. Ordinary commercial testing of samples, for instance, you think ought to be ruled out ?—Ruled out unless it was necessary in connection with scientific investigation ; of course, that goes without saying. But I should say ruled out, unless it were put in at a much higher price than would compete with other people. But I do not think there is any practical difficulty in ruling it out. It is not, I am sure, what most of my colleagues thought was going to be done.

1413. You would distinguish, I presume, between the routine testing of samples and the testing of materials which involved some element of research ?—Undoubtedly.

1414. The latter would be a proper subject for investigation by the Laboratory ?—Yes.

1415. Supposing that a certain problem was submitted by a private firm or individual, with the ultimate intention of making a commercial profit in connection with the results of the investigation, do you think that the National Physical Laboratory should refuse to undertake such investigations unless the condition of immediate publication was attached ?—Do you attach any importance to "immediate ? "

1416. I do attach some importance, because there would be a great deal of difference to the originator of the investigation, the person propounding the investigation, if he was allowed to keep secret any results for a period of, say, four or seven years. He might then reap the advantage of it just as if he had a patent ?—I confess that particular point had not occurred to me. I concluded that scientific work done by the Institution would be made public, but I had not realised the difference which you mention, and which is very important. Speaking without having thought over it before, I should have thought that it might be quite possible to arrange that the thing should not be necessarily published immediately. I am speaking without having thought of it.

1417. I quite understand ; it is not a matter to which you have devoted personal attention, and you are only giving an off-hand opinion ?—Yes. I suppose it would eventually be published.

1418. After a period of years ?—I have read regularly the "Mittheilungen" of the Charlottenburg people. They are regularly publishing just such investigations as you are mentioning, obviously undertaken for commercial people.

1419. You do not know what their regulations are as regards publication ?—No. Of course, I can find out ; I have the regulations, but I do not know.

1420. (*Sir John Wolfe-Barry.*) You are giving us an individual opinion now ?—Yes.

1421. Not as representing the Council ?—No, not as representing the Council.

1422. (*Sir Andrew Noble.*) I suppose you would agree that if some firm or person wanted a certain investigation carried on by the National Physical Laboratory, and paid for the whole of that, then in that case it would be reasonable, seeing that they paid for the whole expense, that the results, if they were important to the investigator, should not be published for a certain number of years, to be fixed by the Executive Committee ?—That seems to me to be quite reasonable.

EIGHTH DAY.

Friday, 14*th June*, 1907.

PRESENT:

The Right. Hon. GERALD W. BALFOUR (*Chairman*).

Sir ANDREW NOBLE, Bart., K.C.B.
Sir JOHN WOLFE-BARRY, K.C.B.
Mr. W. J. CROSSLEY, M.P.
Mr. ROBERT CHALMERS, C.B.
Mr. G. C. UPCOTT (*Secretary*).

Sir WILLIAM PREECE, K.C.B., F.R.S., called and examined.

Sir W. Preece.

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1423. (*Chairman.*) You are the retired Engineer-in-chief of the General Post Office, and Past President of the Institution of Civil Engineers ?—Yes.

1424. I think you have taken some part in the early work of the National Physical Laboratory, though you are not a member of the Executive Committee ?—I was on the first executive committee. I went as the representative of the Institution of Civil Engineers, and my term, I think, expired at the end of five years. I am out of it now.

1425. You have been connected, I think, with the Engineering Standards Committee ?—Yes.

1426. And a member of the British Association Standards Committee for 30 years ; and you have been Chairman of the Screw Gauge Committee ?—That is so, and I have

also been a member of every international congress on electrical matters that has been held either in America, or Paris, or here.

1427. When at the General Post Office you introduced specification and rigid testing in connection with the work there?—Yes, at the very first commencement when we were transferred. I served my early years in private enterprise in the Telegraph Companies. In 1870 we were transferred to the Post Office, and then I introduced a system of technical education, and a rigid system of specification and tests.

1428. You have also advised the India Office with respect to Cooper's Hill?—Yes, and from 1867 to 1872 I trained their officers going out to India.

1429. I see you say in your *précis* that you have made much use of the laboratories at King's College and London University. Was that in connection with the Post Office work?—Yes, Post Office work and general work as well. In fact, I do it now occasionally.

1430. Your firm now employs private laboratories like those of Kirkaldy, Stanger and Blount and so forth?—Yes.

1431. So that you have had a large experience altogether in connection with testing work?—In connection with testing work, and with everybody concerned in testing work.

1432. Do you think that the work of the National Physical Laboratory as now carried on encroaches unduly upon the province of private enterprise?—I do not think so at all. I think there is rather a mountain made out of a molehill. There is no doubt there are a few engineers and private laboratories who started for specialities, but they are very limited in extent and limited in business, not to be compared for one moment with the National Physical Laboratory, that embraces all science and all the practical applications of science. Of course there are some such things, like chemical analysis, in which a chemist like Mr. Blount, for instance, is an expert. I go to him now. In fact, it is only very recently that he has undertaken an inspection and a research for my firm.

1433. Clearly a large part of the work of the National Physical Laboratory is such as could not be undertaken by an existing private firm, but is there not a region in which there is a certain overlapping?—There is, and to a certain extent there always must be if there are to be specialists to take a section of the National Physical Laboratory's work. But it can only be a section. In looking at the thing I look at it on the broad view that here we have a great National and Imperial establishment dealing with all branches of science, and it comes to this point, that it must and can only be a question of confidence in work done and the extent of fees. The only complaint of these private laboratories that exist now is that business may go to the National Physical Laboratory; there is no evidence that it has gone there.

1434. Do not you think that a broad distinction can be drawn between ordinary commercial testing of samples and such testing as involves more or less of research work?—Yes, but of course the mere testing of samples means the comparison with standards, and as the National Physical Laboratory must necessarily be the custodian of the standards, so any test that means a comparison with standards should be done by the National Physical Laboratory.

1435. That applies rather to instruments than to materials, does it not?—I think materials as well. For instance, the specification of alloys has become a very important feature of engineering work, and again the question of the electrical quality of new materials. It is only within this last perhaps two months that we have had a new material, the extract from coal produced by this new fuel called coalite. One of the bye-products is a very fine pitch. That seemed as though it had great electrical qualities. I wanted to have it tested, and I naturally went to the National Physical Laboratory, because they had all the skill, all the apparatus, and all the means to test, and I got a very thorough report from them. That could not be done by any existing private laboratory.

1436. And, for that very reason perhaps, that might fairly be described as a case in which ordinary routine testing passes into research?—That is so. It borders on research.

1437. But is there not a great deal of commercial testing which cannot be properly said to border upon research?—Oh, yes.

1438. A material, for instance, has to be proved to be up to specification?—Yes, but take, for instance, the testing of instruments and of coils in the Board of Trade laboratory. They deal there with the standard of resistance, that is the ohm, and the current, which is the ampere, and of electrical pressure, which is the volt. Now the standards are kept at the Board of Trade and all manufacturers and people who have a secondary standard for use in their workshops send the secondary standards to the Board of Trade to be verified. That would be exactly the case with the National Physical Laboratory with the more numerous standards there.

1439. I do not think anybody doubts that the verification of standards is part of the proper work of the Laboratory; but take such tests as those of the breaking strains of materials or chemical analysis?—Ordinary chemical analysis or ordinary tests for breaking strains would be done by the manufacturers themselves. It is done by all the railway companies, it is done by the Admiralty, it is done by the Post Office.

1440. Is it not also done by testing firms such as Kirkaldy's and Stanger and Blount?—I do not think so; not in my experience.

1441. We are told so?—But it is not my experience at all.

1442. Let me put this very broadly. Do you think it desirable that the Laboratory should habitually undertake work that is now done by private firms, and well done by private firms?—I think not.

1443. With your experience of the National Physical Laboratory perhaps you could describe to us some of the work it is at present doing to which you would attach importance?—The National Physical Laboratory is now fulfilling several public services. First, it is dealing with the determination, comparison and custody of the engineering standards of form and structure, apart from those of the legal weights and measures which appertain to the Board of Trade by Act of Parliament. I ought to say that by the Electric Lighting Acts everything relating to the ohm and the ampere and the volt is done by the Board of Trade. They have got a very complete little laboratory there for carrying out that purpose. Then with regard to the work of the Engineering Standards Committee, the National Physical Laboratory has practically done all the work. We required work more of a research character, but in many cases, of course, the practical development of the issue of these engineering specifications has not begun to show itself yet. I want on that point to tell you presently of a special case of how we want to deal with glow lamps.

1444. That comes a little later, perhaps?—It comes a little later and perhaps that will enable me to answer the question you put to me more clearly by taking a specific case. You see that the great advantage of the combination between the Engineering Standards Committee and the National Physical Laboratory is this, that all the work done by the Engineering Standards Committee has been done by engineers of eminence and position. We formed committees of all the best-known men of the country. Over 250 have cheerfully and voluntarily attached themselves to these committees, and the work has been splendidly done. Here we have a magnificent establishment at Bushy, which we all ought to feel quite proud of, where the whole work of these engineering standards has been verified from the scientific point of view.

1445. (*Sir John Wolfe-Barry.*) The Engineering Standards Committee is not a body merely of engineers, but also of manufacturers?—Certainly.

1446. You mentioned only engineers?—Eminent men, engineers and others.

1447. The manufacturing element is largely represented on that Committee?—Yes. In all the discussions, in all the work done by these committees they have brought on their committees not only engineers, but the manufacturers and often the users themselves. We found that particularly useful in the case of the glow lamps to which I shall refer presently. The committees have really been formed of all the skill and all the talent we could possibly bring together on any one particular subject dealt with by that Committee.

1448. (*Chairman.*) Would you go so far as to say that the work of the Engineering Standards Committee could hardly have been carried out, unless it had had the National Physical Laboratory to fall back upon?—I do not think it would have been possible to have carried it out in the way it has been done without the aid of the National Physical Laboratory.

1449. Then with regard to research work initiated by

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private individuals or firms but carried out for them by the Laboratory, what do you say ?—There has been already a good deal of work of that kind done, and there must certainly be a great deal of work in the future. We have never had anything approaching a national laboratory in this country where people can go and get their ideas tested. Here is a place open to the whole country, and if anybody knows that any fad that occurs to him can be scientifically tested for a small sum by the National Physical Laboratory, he will go to the National Physical Laboratory and get it tested. You cannot go to private individuals ; they charge too much. It is so difficult to get any private man who owns a laboratory to go thoroughly and earnestly into another man's fad, but with a national institution like the National Physical Laboratory, with such able assistants and such a capable director, whatever question is brought to them they seem to take in the same earnest way as if it had been their own suggestion. I think there is a very large field for the National Physical Laboratory for research in that direction.

1450. Would you like to give us any illustrations of this kind of work ?—I shall come to the best illustrations that I have got. I shall come presently to the question of glow lamps. I would rather keep the history of glow lamps all together. But there are a great many experiments going on now ; they are dealing with the resistance of different alloys, and here on this question of alloys is the point where the National Physical Laboratory can deal with the whole question, chemically by analysis, mechanically by testing structural strength, electrically by testing the resistance and conductivity and other qualities, and physically by being able to examine the influence of heat and energy in other forms upon the material, so that one may arrive at some idea of its durability which is a very important point. There is the question that I gave you of what is called carbonite, the new pitch ; there is the question of a new alloy called manganin, which is coming in very largely for electrical purposes. There is the case of invar, which is an alloy of steel and manganese and it has the remarkable property of being free from any disturbance from heat and cooling. Its co-efficient of expansion due to heat is nothing. Then there are materials dealing with insulation, for instance. There is a capital enquiry made into the properties of the paper used for telephone cables. It was research as a matter of fact carried out for the Post Office.

1451. Were the other cases that you have mentioned cases of enquiry undertaken at the request of private individuals or firms, or were they general investigations undertaken by the Laboratory as a public body ?—I do not know the history of manganin, and I am not quite sure that it was dealt with by them originally. I think it came from Germany, but I am not quite sure upon that point.

1452. You are rather giving us illustrations of the kind of work ?—Yes, I want to give you illustrations of the kind of work. In my own case I have sent to them three or four times new accumulators for secondary batteries, that have been brought to me, accumulators for traction purposes, particularly for ignition purposes in motor-cars, a constant stream of new things. When they come I invariably send them to the National Physical Laboratory and get them tested there. They are thoroughly well tested, the reports and certificates are always very complete, and the charges are very moderate. Those are things that you cannot give to private people. I do not know the private people who would deal with them, and they are not worth doing yourselves, because in my own particular case in my firm we at one time thought it would be desirable to have a laboratory of our own, but on looking into the matter we found it was very much better to rely on others, and we employed the National Physical Laboratory, and we employed Stanger, who is dead now, by the by. Then there is Mr. Blount, whom I mentioned before, there is Faraday House, there is the laboratory at King's College, and University College. I have not, by the by, done anything at University College since Sir Alexander Kennedy left.

1453. As you have had experience of all these various testing establishments, would you tell me whether your choice in any particular instance is determined with reference to the character of the work ?—It would be with reference to the character of the work. It is only two or three weeks ago I had to report on the quality of Trinidad bitumen. That came through the Crown agents of the Colonies, and the only man I knew who could satisfactorily deal with it as I wanted it to be dealt with was Mr. Blount, so I sent it to him and he carried out the thing very well, but his field is not a very large one. Now I might have sent to the National Physical Laboratory, and it would have given them a great deal of work, but I do not think they could have done it as quickly as Mr. Blount was able to deal with it, and it was a question of speed. I got the report back in really a very short time.

1454. You would send it to whatever institution you believed would do the work best ?—Certainly. That would be the sole condition that would guide me.

1455. Where a private enquiry has been carried out by the Laboratory for private persons, do you consider that the results should be kept private ?—I do.

1456. If those at whose request the enquiry has been undertaken desire that they should be kept private ?—Yes, of course. For instance, if a faddist wanted his fad tested, and he found that his ideas came out right and he wanted to take out a patent, his patent would be invalidated, he could not take a patent if the results of the enquiry that he desired were made public. I should say the practice of Germany with respect to that is a good one, because they do keep private research secret.

1457. I suppose you are aware that the Committee of 1898, on whose report the Laboratory was founded, recommended that publication should be the rule, even where the enquiry had been paid for by private individuals, and non-publication the exception ?—I was not aware of that. Is that a recommendation ?

1458. It is in paragraph 24 of the Committee's Report. "The results of investigations undertaken at the request of private individuals should, except in special cases to be approved beforehand by the governing body, be published or be accessible to the public, even where the cost of the investigations is fully defrayed by the persons in question." —I had quite forgotten that, but I do not at all agree with it.

1459. You do not agree with it ?—No, I think the effect would be simply to deter people from going to the National Physical Laboratory. The great point I want to try and urge is this, that the private laboratories are very limited, and the National Physical Laboratory is unlimited. That will be a guiding feature in the future in the success of the National Physical Laboratory. It covers all industries, whereas the private laboratories only deal with one or two.

1460. So that where an investigation really involves the application of more than one branch of knowledge there would be many cases where such an investigation could be carried out by the Laboratory but could not be carried out by any existing private institution ?—Exactly. It would be for the individual who wanted the enquiry to select between a private laboratory and the National Physical Laboratory. If the rule were carried out, that everything is to be made public, then it would be a very good thing for the private men. On the other hand, if all were alike it would simply be a question of fees, and I do not think that is a very serious question. My idea is that there certainly should be a little difference in favour of the public going to private individuals with regard to fees.

1461. You think whatever overlapping there is between the work of the Laboratory and of private institutions at the present moment, and whatever encroachment there unavoidably may be in the work of the Laboratory on the field of private enterprise, could be met by requiring that the Laboratory fees should be somewhat higher than those charged in private establishments ?—I think that is a very simple solution of the difficulty, and I suggest even more than that, that in the case, say, of treading on the corns of chemical analysts the scale of fees for the Laboratory should be decided upon in consultation with the Institute of Chemistry.

1462. Perhaps now you will pass to the question of glow-lamps, which you have referred to once or twice ?—Yes ; I have been very much personally interested in the introduction of glow-lamps from a very early day. I brought forward Edison's glow-lamp before the Society of Arts in 1881, and from that day to this I have been watching with a very great deal of care the growth of the glow-lamp. I have tested it scientifically as well as practically, and I have given several papers on the subject to the Royal Society, to the Institution of Electrical Engineers, to the British Association, and I may say in all the work that I have done I have always published it at once in one or other of these Societies. In 1884 there was an exhibition called the Healtheries, and there a committee was formed, with Lord Rayleigh as Chairman, and a very good committee it was. I do not quite remember their names ; I was on it ; and we made a report, and the sum of our report was that the manufacture of glow-lamps seemed to follow no rule, and no method, and no order. In 1894 it had become

very bad; you were supplied with lamps called 8 candle-power lamps and 16 candle-power lamps and other lamps, but they never were anywhere near the prescribed candle-power, and in 1894 and 1895 I carried out at the Post Office a very heavy enquiry into the behaviour of all these glow-lamps. The result of it was that in 1896 I read a very long paper on the whole subject to the British Association, and brought out the first specification that was drawn up for the manufacture of glow-lamps. The Admiralty followed suit; they had a specification, and the War Department had the same. We three Government Departments had our lamps constructed to specification, and we had them tested. We each had our own laboratories for the purpose of testing, and the result was that we always got good lamps, the best lamps. We now learn that the manufacturers always laid aside for us the cream of the lamps, as they call it, they worked to comply with the specification, so that really the Government Departments for the past ten years have benefited by the introduction of the system of specification.

1463. And the public at large have suffered. They have to put up with the inferior lamps?—The public suffer terribly. This came early before the attention of the electrical section of the Engineering Standards Committee, and I brought the whole matter before the main Committee. Sir John Wolfe-Barry is the Chairman of the main Committee and I am Chairman of the Electrical Plant Committee. We decided that we should form a sub-committee to go entirely into this subject of the glow-lamps. We appointed, as chairman of that committee, the Director of the National Physical Laboratory, Dr. Glazebrook. We got together a splendid working committee. We have been at work now for two years, and we have got a specification that satisfies the manufacturer and satisfies the retail distributor, and it will satisfy the user when the user is able to take advantage of it. But we find that this specification has not yet been accepted universally by the manufacturers. There are only two or three who work to the specification, and the great moving force against the introduction of the benefit of this specification is the fact that lamps can be imported into this country from Germany without any mark whatever; they are quite plain, whereas those you buy in the shop have always indicated upon them the voltage under which they should be run and the candle-power that they give, and I think as well, as a rule, the name of the maker.

1464. (*Sir John Wolfe-Barry.*) Could you give us any idea of how much the public are suffering in the matter of lamps?—No; only that it runs into millions of lamps.

1465. I meant how much the lamps fell short of what the public thought they were buying?—It is a very frequent thing to get a 16 candle-power lamp that would not give seven candles, and the variation is perfectly absurd; never on the right side, but always below. We are all of us suffering in our houses at the present moment from the want of order and method in the disposal of these lamps.

1466. (*Chairman.*) Is that the case with the English made lamps as well as with the German made lamps?—Yes. People are now buying in shops lamps marked with names that never had anything to do with the manufacture of the lamps. Retail people in the country are selling lamps as their own.

1467. And the marks indicating the candle-power of those lamps are quite untrustworthy?—Absolutely untrustworthy.

1468. And you say on the German made lamps there are no marks at all?—There are no marks at all; but they are purchased by English tradesmen, who get them marked in any way they like. I have no proof of it, but I have no doubt there are lamps marked Edison and Swan that were never made by Edison and Swan. The evidence is very striking, and it is so striking that Sir John and I have had a visit to the Board of Trade. But I want you to realise the fact that there is now absolute fraud going on in the supply of glow-lamps to the users in this country.

1469. (*Sir John Wolfe-Barry.*) It is right to say, is it not, that the public who have a lamp which is professedly a 16 candle-power and which only gives a 7 candle-power light have to pay for the current as if it was 16 candle-power? Is that so?—Yes. You see, it is an inefficient lamp. These inefficient lamps require more current to give much less light. They are poor things.

1470. So that the public lose it both ways?—The public lose it in their bills.

1471. They lose the light, and they have to pay for the current for a larger amount of light?—That is so, and therefore it is a serious public question. It really comes to this, that an excellent specification is practically at the present moment valueless, because we cannot force the manufacturers to adhere strictly to the clauses of the specification, and also because the foreign lamps are imported without any test at all. There is only one remedy for that, and that is to take advantage of the Trade Marks Act, so that if any mark on a glow-lamp can be registered at the Board of Trade as a trade mark, then any departure from that trade mark will become an offence under the Act of 1905. We have discussed this matter with the Board of Trade, and the Board of Trade are quite ready to make a mark that we agree upon, a sign under the clause of the Trade Marks Act. It remains for Sir John Wolfe-Barry and myself to have another interview with them, but we cannot do so at present, for this reason: we must have a public institution competent to test, not all the lamps, but a sample lamp sent. For instance, supposing I wanted ten 16 candle-power lamps for my office, and I sent to a retailer here, I want a place where I could send two or three of those lamps to be tested in comparison with the standard, and you will gather from what I said before, my impression is that there is no institution in this country more competent to do this than the National Physical Laboratory.

1472. (*Chairman.*) Is that work already carried out by any private firms?—I do not know that it is.

1473. I think we have had evidence here that it was so carried out?—Well, it is carried out to a certain extent, but there is no private firm that has standards verified so frequently and imparting such confidence as the standard of the National Physical Laboratory, except perhaps the standards of the Board of Trade. But the public cannot send lamps to the Board of Trade to be tested for their candle-power. The Board of Trade can only test for resistance, for current, and for voltage.

1474. What you suggest, then, is that glow-lamps should be treated like thermometers?—Exactly; thermometers, chronometers, watches, magnets and compasses, and all the work now done by the Kew part of the National Physical Laboratory.

1475. (*Sir John Wolfe-Barry.*) But is not the point this that if there is to be a mark, that mark must be held by some testing authority?—Yes, I meant to have said that.

1476. Otherwise the trade mark cannot be legalised?—It could not be held by a private individual. It could be held by a laboratory set up, if necessary, by the municipal institutions of this country. The association of municipal bodies—and they have an electrical association—have expressed their willingness to consider the establishment of a laboratory for the purpose. But it must be central, and it would be an exceedingly difficult thing to have these authorised laboratories if they could be authorised all over the country. It wants to be central. Here is an institution existing, a central institution in Bushy Park, and I think myself that the authorisation of the testing of glow-lamps by the National Physical Laboratory would meet a great want and do a great amount of good. We should all benefit by it, and it would do it in a way infinitely superior to anything done by private individual laboratories.

1477. (*Chairman.*) I take it your view is this, that it is very important in the public interest that there should be some readily accessible means of testing glow-lamps, and in point of fact the object at which you aim in connection with the testing of glow-lamps cannot be properly carried out except by a public institution?—They would not be authorised except for a public institution.

1478. Have I correctly stated your position so far?—Quite correctly. The point I had forgotten was that under the Electric Lighting Acts the Board of Trade can authorise the appointment of inspectors for the purpose of inspecting in the different towns, but there is this great difficulty in carrying that out, that the electrical enterprises in the country are so numerous, they are controlled and managed by such shifting bodies. A municipal town council, for instance, is a very shifting body, and the officers are constantly on the move, and a testing place is, of all things in this world, the one thing that requires continuity of experience and continuity of thought. We have an example at the Board of Trade office, where the work is splendidly done, because they happen to have a first-class man there who has been there ever since the Laboratory was established, about 14 years ago. It would be the same in the National Physical Laboratory. There will always be continuity of service there: there will be always men there who have acquired the necessary experience by this long service.

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1479. Is it not the fact that glow-lamps deteriorate in course of time?—Oh yes; all glow-lamps deteriorate.

1480. Even without being used?—No; it is a consequence of usage, and in our specification we define that every lamp, apart from it complying with the mark, which means its initial performance in giving light with such-and-such a current, shall have a useful life, and the useful life of a lamp is defined by the number of hours that it takes for that lamp to fall 20 per cent. in its efficiency. Take a 20 candle-power lamp: we specify two classes of lamps—one a high efficiency lamp, and the other an ordinary efficiency lamp. The high efficiency lamp has a useful life of 800 hours, and the low efficiency lamp has a useful life of 400 hours. That means that the one lamp does not deteriorate as rapidly as the other lamp, and the deterioration depends entirely on the surface of the carbon filament. The carbon filament has to pass through a kind of hardening process. Hydro-carbon gases are deposited on it by very high electro-motive forces, and it gives a very thin layer of crystallised carbon. That costs money, so that a good coating of this crystallised carbon gives you greater durability, and a high-class one will last 800 hours, while the one that has not been so coated will last only 400 hours.

1481. That would form part of the test, whether it will last 800 or 400 hours?—That is part and parcel of the specification. I have got the specification here. It specifies certain classes of lamps as standard lamps, 8, 12, 16, 25, and 32. It also gives the standard mark we hope to get accepted as a trade mark, and it specifies a form of cap, and the vacuum, and all other points.

1482. I think perhaps it is hardly necessary for us to go into those details?—No; I was just running through it. I know I am right about the 400 and the 800 hours as being the useful life.

1483. If the Laboratory was going to undertake the testing of glow-lamps for the whole of the United Kingdom, would not that add very seriously to the work of the staff?—Yes, it would, if it were very much adopted by the public; but in the first place, the very fact of the existence of this restriction on the manufacturers would secure infinitely better lamps than we get now, and the necessity to have them tested would diminish very fast. I have never come across a case of an ordinary user having his lamps tested. They submit in the calmest way to the loss of light. They never think of sending a lamp to a laboratory. But the reason why I feel so strongly on the whole business is that the effect of this machinery on the manufacturers will be most beneficial. They will at once adopt the specification and carry it out, and everybody will be benefited.

1484. Are there any other observations you would like to make to the Committee on the work of the Laboratory?—There is one other point. No private individual, unless authorised by the Board of Trade as an electric light inspector under the Act, could possibly do the tests necessary, so that it would really be confined to the National Physical Laboratory, to laboratories established by local authorities over the country, or to men who have been appointed by the Board of Trade inspectors under the Act. As a matter of fact, there is one man now who is appointed an inspector by the Board of Trade because he has an efficient laboratory; that is Mr. Harrison, who is the Principal of Faraday House.

1485. We had evidence from him a week ago?—Yes; he is an inspector under the Board of Trade.

1486. I think his impression was that if this work was done by the National Physical Laboratory it would interfere very considerably with his own field of activity?—That is wholly governed by the question of fees. It would be unfair to deprive him of his work. He could do the work, but he could not do the work so efficiently as the National Physical Laboratory.

1487. Is there anything else you would like to say to the Committee?—No; I would simply add that what I say about glow-lamps really applies to nearly everything else, especially with iron and steel—metallurgical operations of that kind. I have only desired to bring this glow-lamp history before you because I have been so much personally mixed up with it. There was just one point that I rather wanted to impress upon you, and that is the admirable way in which the photometry is done at the National Physical Laboratory. I mention this because I am really interested in it, and it arose in this way, that I relied on private people to do this testing, and the only laboratory there was in existence was in Victoria Street, Westminster. I cannot remember the man's name; he started a laboratory there. He advertised for lamp testing and all that sort of thing. I gave him several lamps to test, and then he came to me one day, and he said he was obliged to give it up; he had failed; he wished I would take the laboratory off his hands. The end of it was I did. I bought the photometer, the whole apparatus, and everything else, and gave it to the National Physical Laboratory, and that is the origin of the photometric establishment at the National Physical Laboratory.

1488. (*Sir John Wolfe-Barry.*) Am I not right in saying that, assuming it is desirable that glow-lamps should bear a mark which would be some guarantee of their efficiency, the Board of Trade, although they sympathised very much with the desirability, said that the only way of its being brought about would be for some testing authority to be legalised by licence to hold the mark?—That is so.

1489. And that authority must be an authority which fulfils the specification as to its position in the Act of Parliament?—That is so.

1490. And that the Engineering Standards Committee was not a body which could hold the mark from the Board of Trade as not being a legalised authority?—Nor a permanent one.

1491. Therefore, if it is desirable that there should be a recognised mark of efficiency, the mark could only be granted to a testing authority?—That is so.

1492. And that the National Physical Laboratory would fulfil all the requirements of the Act of Parliament in that respect?—It would.

1493. I think I am right in that, am I not?—You are quite right.

1494. Therefore, however desirable it would be to have a mark for efficiency, the most natural thing seems to be to grant that mark to the National Physical Laboratory?—I think so.

1495. Then with regard to the effect of concentrating so much work at one place, at Bushy Park, has not it been suggested that the mark should be one for the whole kingdom, but that it might be sub-granted, as it were, under the supervision of the National Physical Laboratory to various centres in the country?—Yes, we thought that Edinburgh, Dublin, Manchester and Bristol—I think those were the four—might be made subsidiary to the National Physical Laboratory.

1496. But supervised from time to time by the staff of the National Physical Laboratory?—Yes.

1497. So as to avoid undue concentration of work at Bushy?—Yes.

1498. But yet to have one recognised mark of efficiency for the whole country?—We discussed that.

1499. Leaving that question now, with regard to publication or not of the results obtained at the National Physical Laboratory by experiment for private persons, the objection to publication I think you have put as interfering with the right of patent?—Yes.

1500. Would not that be to some extent got over if the time were limited during which non-publication should be possible?—Yes.

1501. But assuming that the public view of the work done by the National Physical Laboratory should be upheld as being for the general advancement of knowledge, is it not absolutely necessary that that knowledge should be communicated within one or two years of the knowledge being obtained?—If a man did not patent it within, say, two years, it might be made public.

1502. That was my suggestion to you, whether that would not get over that difficulty?—I think it would.

1503. On the general question of what is called routine work it has been represented to us that a certain amount of routine work is a very valuable thing to the staff of the National Physical Laboratory. Do you concur in that view?—Yes. I even go so far as to think that I could see in the future the National Physical Laboratory as a very highly extended branch of the new Technological School for scholarships, where persons could be trained in this art of measurement which, after all, is a very great art. I think the functions of the National Physical Laboratory can be extended in that direction very considerably.

1504. It has been represented to us that if the National Physical Laboratory were confined entirely to what is called research work, the staff of the Laboratory would not be so well acquainted as they now are with what is ordinary possible and requisite in commercial circles?—Yes, we find that in teachers.

1505. Do you agree in that?—Quite. I do not think

any teacher for any technical subject or any branch of engineering should be otherwise than one who has practical experience in work in the profession.

1506. But you would be in favour of the fees being kept either abreast of or certainly not under, and possibly above, the ordinary fees of private testing establishments ?—Yes.

1507. Could you tell us whether there is any uniformity of fees among the various private testing establishments ?—None whatever. A ridiculous variety as a matter of fact.

1508. But supposing they could all come together and agree upon some sort of scale, and the National Physical Laboratory were to agree that their fees should certainly not be less but probably rather more than the fees suggested by private testing establishments, would that get over the difficulty of undue competition ?—To a certain extent, of course, it would. It would take the question of price out of competition, and then the competition would only be the competition of reputation. But my own view is, at any rate at present, that as these private individuals—they are very few in number—are so much disturbed by the possibility of their business being interfered with, I should rather like to see the National Physical Laboratory's fees raised above theirs.

1509. Above the private proprietors ?—Yes, I think so. It would calm them very much.

1510. (*Mr. Crossley.*) Do you not think that a man wanting a private investigation done would have a right as a member of the British public to go to the National Physical Laboratory and ask that that investigation should be made for him and that it should be kept private, leaving them to charge what they liked ?—It ought to be so, but from the recommendation of the Committee, which has been accepted, it is not so.

1511. But I am asking your opinion ?—My opinion is distinctly in favour of keeping the results of a private enquiry private, with merely the time limit suggested by Sir John Wolfe-Barry.

1512. When you sent those accumulators, &c., for test you did not think you were treating the other people in the same trade unfairly, did you ?—I had not the least idea of such a thing. I simply sent it there because I knew that I should get the work better done.

1513. Can the Board of Trade give an efficiency mark for lamps ?—No.

1514. Can Mr. Harrison, of Faraday House, give an efficiency mark ?—No.

1515. Nobody can at present ?—Nobody can at present.

1516. You wish to say that some such efficiency mark should now be established ?—I would not call it an efficiency mark. I should call it a trade mark implying that the lamp complies with the mark, the mark being the standard established by the Engineering Standards Committee.

1517. A standard of efficiency has been established for the glow-lamp ?—It has.

1518. And you propose that someone should have the right to give a mark showing that that lamp came up to the standard ?—Yes. The mark proposed is simply the name of the maker, the candle-power, say 16, voltage 230, and then the letter D representing 800 hours, or A representing 400 hours, so that the letter indicates efficiency.

1519. (*Sir Andrew Noble.*) Sir John Wolfe-Barry has asked, I think, almost all the questions that occurred to me, but for my own information I want to ask one question and that is this. You said that 16 candle-power lamps were sometimes as low as 7 candles. Does that apply to a batch of lamps, that is to say, if you got a batch of lamps of which you tested one and found it only 7 candle power, would you expect the whole of the batch to be about that or would they be variable ?—They are very variable. I am quite sorry I have not diagrams of figures to show you, for they are very variable. I should like to give one fact in answer to Sir Andrew, and that is that the Americans sent over here an order to purchase lamps from various houses in London, and they got samples of, I think, 20 lamps of every known make sold in the open market in London. These lamps were sent over to the States, and they were, by the Electric Light Combined Companies of New York, tested in a capital laboratory that they have there that I have seen only very recently. They were tested in comparison with lamps of the same number and the same candle-power purchased in America. Our English lamps were an absolute disgrace to us. Really I know nothing that has occurred in my professional experience that gave me more disgust than to see these variations that Sir Andrew Noble referred to existing in lamps of the best names, purchased in the best shops in London. It was so bad that I got some lamps here and sent them to Dr. Glazebrook. They were tested by the National Physical Laboratory for the Committee, and the tests of the Americans were confirmed. It really amounts to this, that lamps purchased in the best shops in London are absolutely not to be depended upon at all for their candle-power, and it is a great reason in favour of the establishment of what Sir John Wolfe-Barry and I so earnestly desire, that there shall be a trade mark, with power of testing, which will stop this great variation in candle-power. Let me tell you as a fact in the present manufacture of lamps they are made anyhow. A lamp with the same filament, made exactly in the same way, the vacuum reduced to exactly the same pressure, may give 6-candle, 8-candle, 10-candle, or even more candle-power. These lamps are sifted in steps of 1 candle-power, so that in the manufacturing shop they are all sifted away into their supposed rapid test made by an ordinary workman of the candle-power. The result is that when they sell the lamps they are all mixed up anyhow.

1520. (*Sir John Wolfe-Barry.*) With regard to the testing of lamps, you do not suggest that every individual lamp should be tested, do you ?—Oh no. In testing lamps we only take 5 per cent. of a batch of lamps.

1521. (*Mr. Chalmers.*) What good is that if you only take 5 per cent., when they vary individually so enormously, as I have gathered from you ?—I am only speaking of those made under specification. My answer applies to Post Office and Admiralty practice, where we have got a specification. The lamps I am speaking of are not made to this, and are not tested at all by anybody.

1522. (*Sir John Wolfe-Barry.*) That is one of the points I wanted to elucidate. The advantage of a mark is that it gives the buyer a right to the excellence of the lamp which the mark implies ?—Yes.

1523. And if he does not get it on test he has a right of procedure against the person who supplies him ?—That is the point.

1524. Therefore it is not necessary to test every lamp, but a batch of lamps may be tested, and if any of that batch falls short there is a right of action against that person who supplied the lamps ?—Certainly. There has been a good deal of controversy between the makers and these different Committees as to the number of lamps that should fail in order to justify the rejection of a batch. If you take them in boxes of a hundred, say, you are at liberty by the contract to take five. If a certain number of those fail (I forget what the number is), then the whole batch is rejected.

1525. That is by the contract ?—By the contract. It is rather an important point. This is the clause : "Not less than 5 per cent. of each type of lamp of any consignment shall be selected by the representative of the engineer or the purchaser for these tests. If more than one tenth of the lamps thus selected fail to pass the test, the selection shall be replaced by a further selection of not less than 5 per cent. from the consignment. Should more than one tenth of these latter fail to pass the test, then the entire consignment of the particular type of lamp under inspection shall be liable to rejection."

1526. That is because the lamps represent themselves to be something that they are not ?—Yes, and that is only possible under a specification like this.

1527. (*Chairman.*) But the testing of these lamps by the Laboratory would be a very different thing from the testing of thermometers. In the testing of thermometers each thermometer is tested and certified ?—That is so.

1528. In this case a few are selected ?—Yes.

1529. And the National Physical Laboratory would not certify those, I presume. It would merely make a report upon them ?—The National Physical Laboratory, if it were the inspecting institution, would simply have two or three lamps sent, and it would be asked if they complied with the mark on the lamp. It assumes no responsibility, and it is for the user, the purchaser, to reject if he wishes.

1530. (*Sir John Wolfe-Barry.*) But under the Trade Marks Act, if I buy a lamp with a trade mark on it, and it is proved not to have those qualities that the trade mark implies, I have a right of action against the person who sold it to me ?—Of course.

1531. At present there is nothing of that kind ?—There

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is nothing whatever. The non-compliance with the mark gives you that power.

1532. (*Mr. Crossley.*) I suppose the life depends upon the vacuum to a great extent?—Very much. That is also specified in the specification. In fact, that specification ought to be in everybody's possession. If we only followed the specification and learned more about the lamps we should enjoy our light, I think, a little more.

Mr. Alexander Siemens, called and examined.

Mr. A. Siemens.

1533. You are past President of the Institute of Electrical Engineers, and a member of the Council of the Institute of Civil Engineers?—Yes.

1534. You were a member of the Treasury Committee appointed to consider the desirability of establishing National Physical Laboratory?—Yes.

1535. Do you still concur generally in the report made by that Committee?—Yes, I believe that the conclusions which were arrived at at that time were the right ones.

1536. Has subsequent experience induced you to alter any of the opinions expressed in the report of the Committee?—No, not at all. I wish to draw particular attention to paragraph 9, in which it is very particularly stated that further facilities are needed by the public both for scientific and commercial use. I wish to declare again that in the original establishment of the Laboratory the commercial part was taken into consideration, and was considered quite as important as the scientific part.

1537. That same paragraph, further contains the statement that "It would be neither necessary nor desirable to compete with or interfere with the testing materials of various kinds as now carried out in private or other laboratories"?—Perfectly; but look at the next words: "But there are many special and important tests and investigations which might be conducted with great advantage at the Laboratory."

1538. Do you think that the letter and spirit of clause 9 have been observed in the actual practice of the Laboratory?—Certainly.

1539. Do you think, when the Laboratory issues pamphlets offering to do commercial testing at a particular price, that they have, in so doing, observed the spirit of clause 9.—Yes, certainly, because at the end of clause 9 it says, We could give other instances, and so forth, proper for investigation as distinct from the ordinary testing of materials used in commerce. That was at the time discussed, and explained that the ordinary testing of materials in commerce means that if I order so many tons of copper wire and I have hanks of copper wire selected to be tested at our works, I should not send those copper samples, which are absolutely for commercial purposes, to the Laboratory.

1540. But if such samples are sent to the Laboratory, up to the present time it has undertaken to test them?—Yes, but not in the ordinary testing of commerce. I may send one or two samples just to test my own testing, and get my own testing standardised, so to speak. That is quite another matter from commercial testing. Commercial testing cannot be done at a laboratory; it can only be done at the works, because we use hundreds of tons of copper wire for submarine cables, and steel wire, and so on, and we have to do the commercial testing of course, but we certainly should like from time to time to send some samples to the Laboratory and have them tested as a check upon our tests. That was the very thing the Laboratory was established for.

1541. But this report was intended to lay down the general lines upon which the Laboratory should proceed, not the general lines to be observed by firms wishing to send materials to be tested by the Laboratory?—Conversely, the Laboratory was to undertake such tests of commercial matters if the firms wanted it.

1542. But the words of that last sentence which you have quoted are: "The ordinary testing of materials used in commerce or construction of machinery which can be and is now efficiently conducted at private establishments." The private establishments are not manufacturing establishments but testing establishments, and we have had many complaints from testing establishments that the Laboratory has been catering for work now conducted at these private establishments?—That is not the ordinary testing that the Laboratory does. I think you can best do it if you compare the evidence which was given by Sir William Anderson.

1543. In the pamphlet issued in 1902 it is stated: "The main work of the Laboratory will be two-fold:—(1) It will undertake such experimental investigations in physics and engineering as, in the opinion of the Executive Committee may be useful to the advancement of trade and industry, (2) It will undertake all such tests on machines, instruments and materials as its equipment will permit." It has carried out that second branch of its work by issuing priced pamphlets, pamphlets indicating that such-and-such work will be undertaken at such-and-such a price?—That is quite right.

1544. And this includes the ordinary testing of materials?—But you must not lose sight of the fact that even if the Laboratory were occupied all day long and all night long it could only do a very small percentage of the testing which has to be done. What I wish to draw your attention to is the point which Sir William Anderson makes in his evidence. He is asked at Question 1614: "What are your reasons for thinking that is not the best way of doing it?—Because in our dealings with the trade with contractors they are not always willing to accept our decision when a dispute arises." That is the point where the National Physical Laboratory comes in, that if there is a dispute they are people who can be appealed to, and there is no doubt about their disinterestedness. At Question 1620 he is asked: "Do you think it desirable that that should be undertaken—that is, this sort of testing?—I think so. I think it requires a public authority which everyone can appeal to."

1545. That is in cases of dispute. The cases I am referring to are not cases of dispute.—Yes; but I as a private firm want to be able to go anywhere I like, and if I choose to go to the Laboratory in preference to a private establishment I do not see why I should not. I want to know beforehand what it will cost me, and therefore I want a priced pamphlet.

1546. But the question is not whether your firm desires to go to the National Physical Laboratory, but whether, having regard to the report of the Committee on which that Laboratory was established, the authorities of the Laboratory are entitled to take that work when it is of an ordinary commercial or routine character, and is such as is now satisfactorily done by private testing firms?—Yes, but I am speaking here, I take it, as a member of the public or as a member of the industry, and not as a member of the Committee.

1547. Yes, but let us keep the two questions distinct. In the first place, I think you stated as a member of the Committee that it was your opinion that the National Physical Laboratory had not transgressed the lines laid down in Clause 9?—Perfectly.

1548. Let us finish with that first?—Very well. It is not ordinary testing that the Laboratory does, and this paragraph 9 was meant in that sense. Of course Sir William Anderson referred more to matters in dispute, but also in ordinary matters, if I want to have anything tested, and I want to have an authority which is beyond dispute, I go to the Laboratory I do not go to Mr. Jones or Mr. Smith.

1549. Are you keeping the two questions distinct? I want in the first place to ascertain whether you think what is actually done at the Laboratory is consistent with what was recommended in this Report. We can afterwards come to the question whether the recommendations of the Report were too narrow or not. But let us stick in the first place to the other question: Have the recommendations of the Committee been properly observed by the authorities of the National Physical Laboratory?—I certainly think so. My opinion is that the work which the Laboratory has done is not ordinary testing of materials which can be and is now efficiently conducted at private establishments. The private establishments cannot do the testing the same as the Laboratory, because they have not got the same authority. I put that in my abstract in reply to those questions which have been put. I say, "There is no possibility of the Laboratory interfering

with other agencies undertaking similar work, as the other agencies have not the same standing."

1550. Do you interpret the words, "is not efficiently conducted at private establishments" in such a way that you think the National Physical Laboratory would be entitled to say, "We do this better than private establishments, and though it is work which is well done by private establishments we can do it better, and therefore we are entitled to do it" ?—Certainly. That is my opinion.

1551. You would also say, I suppose, that if that was not the true interpretation of the recommendations of the Committee, those recommendations should be modified so as to accommodate them to the view you have now expressed ?—That is, of course, the other question. I am perfectly willing that the scope of the Laboratory should be extended if there is any doubt on the subject. But what I wish to say is, that the Laboratory has got an authority which must be wanting in any private undertaking, and it is very desirable for the commercial and industrial interests of Great Britain that such a public authority should exist.

1552. As regards the question of publishing the results in cases of investigations undertaken at the request of private individuals and paid for by private individuals, what is your view ?—I would again refer to Sir William Anderson's evidence, because that was leading the Committee, I think. At Question 1688, in reply to Sir Andrew Noble, he said: "I think there ought to be the possibility of carrying out investigations at the instance of a person who wishes them carried out so that he alone should have the advantage of the knowledge obtained, at any rate for a limited time," and in reply to Question 1693 he says: "But you see a man may be bringing out some new invention in metallurgy, we will say, and he wants certain experiments made, but these experiments will not bear fruit for a couple of years," and so on, and that made the Committee put this into Paragraph 24 of their Report. They say generally that the work should be self-supporting, and the results of investigations undertaken at the request of private individuals should, except in special cases to be approved beforehand by the Governing body, be published. That is my opinion still, that the results generally should be published, but the Governing Body should have the power to say: "We are convinced that this man wishes some investigation which is rather important and which for some reason or other it is better to keep secret for the present, and that may be kept secret, of course the man paying everything.

1553. You are still of opinion that the general rule should be publication and the exception non-publication ? —Perfectly.

1554. (*Sir John Wolfe-Barry.*) Could you tell us what is the practice of the Reichsanstalt on the subject of publication ?—I believe it is exactly the same, that they have the power of keeping the investigations secret under certain conditions.

1555. Is that exercised, do you know ?—I am sorry I have made no enquiries about that. I could not tell you.

1556. On the other subject of what is called commercial testing, does the Reichsanstalt or any other Government institution in Germany undertake what is usually called commercial testing ?—Yes. You know the National Physical Laboratory here is really a combination of the Reichsanstalt and the Versuchsanstalt. All disputes which lead to lawsuits have to be referred officially, from the whole German Empire, to the Versuchsanstalt, instead of to any private arbitrator.

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1557. (*Mr. Chalmers.*) To which of these two ?—That is the Versuchsanstalt.

1558. Quite so, which is not the research institution, I think ?—No, but it is one of the institutions which we visited in Perlin and which were to be the model on which the National Physical Laboratory was to be carried out. There is one I find here; this was for testing concrete. In all cases relating to the quality of concrete the samples are to be submitted to the Versuchsanstalt, or to the Royal Testing Station as it is called, and they are to act as arbiters. Therefore, all private experts are excluded.

1559. (*Mr. Chalmers.*) There are no references to the Reichsanstalt, are there, of an arbitration nature ?—I do not know of them. There may be, but I only just came across this particular one.

1560. (*Sir John Wolfe-Barry.*) Is it your impression that the public generally have the right of the use of the Versuchsanstalt ?—Certainly.

1561. On payment of the prescribed fees ?—This is a priced pamphlet which they publish, and they give the shape of the test pieces which have to be sent in, and they give here the various tests and what each of the tests costs. It is absolutely the same sort of thing.

1562. (*Mr. Crossley.*) Does the question arise in your mind as to whether it is quite fair to other establishments, as there are so many of them in this country, that an institution established by Government funds should compete with them in price ?—I have already said that I do not acknowledge that there are any other establishments which can be compared with it. It is an absolutely independent and impartial authority.

1563. But I think you would admit that it does much the same work as other establishments do ?—Perfectly, only it does it better.

1564. Would you think it fair that they should charge just the same prices, or would you put them up a bit ?—I would not mind having the prices put up, because my theory is if they do the better work they may have the better price. That follows.

1565. Does a reference to the Versuchsanstalt in Germany carry with it a sort of legal decision against which there is no appeal ?—Only this; they say they are to act as experts. Of course the same value attaches to the dictum of the Versuchsanstalt as to the dictum of an expert.

1566. Not more. It would not settle a case. It is not a final arbitrator in a question ?—No. The judge has to give the decision in a law suit, and the expert of course only gives evidence. But no other person can give evidence in such cases and, therefore, it practically settles it.

1567. (*Sir Andrew Noble.*) In the case of a patent not being possible, would you see any objection to the publication being deferred, for a certain number of years, of any experiment which was carried out at the whole expense of an outside inquirer ?—I think in that respect I would try and give the Executive Board as much power as possible and let them judge each case on its merits.

1568. Would the effect of publication being in all cases made immediately or at a short interval be to drive away from the Laboratory work that could better be performed there than anywhere else ?—Certainly.

Mr. ROBERT KAYE GRAY, called and examined.

1569. (*Chairman.*) You are managing director of the Indiarubber, Gutta Percha and Telegraph Works Company of Silvertown, London, and Persan, in the Department of Seine et Oise, in France ?—I am.

1570. Have you had any experience of the work done by the National Physical Laboratory ?—Yes; about three years ago we had certain investigations made. The question that we wanted to get information on was the similarity of two gums, balata and gutta-percha. We asked the National Physical Laboratory if they would undertake it, and the report we got from them was exceedingly valuable. It was a special kind of report in so far that it had to deal with physical properties and chemical properties, as well as electrical properties, and we were quite satisfied with the results of it. We wanted it really to confirm the work done in our own laboratories by our own men.

1571. That was not a case in which by any possibility it could be said that the Laboratory was encroaching upon the province of private enterprise ?—Not at all.

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1572. There was no private firm to which you could have referred this investigation ?—None at all.

1573. Is it your opinion that the National Physical Laboratory has encroached upon the field of private activity in an illegitimate way ?—Of course I cannot speak from personal experience in the matter, I can only form an opinion on the subject; but I think that it has done practically no harm whatever to other agencies.

1574. That opinion refers to the work actually done up to the present time ?—As far as I know it.

1575. Do you think that in the future there is much danger of injury being done to the private agencies ?—No.

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I do not see how it can injure them very materially. Of course there must be a certain amount of injury done, but it is quite a question whether advantages might not counterbalance that in certain directions; that is to say if there are testing laboratories, as there are many, for instance, so far as electrical matters are concerned, like Faraday House, no doubt the National Physical Laboratory would do certain work similar to that which they are doing. It may be a little hard on such a place, but still, looking at it from a broader point of view than that, it would be difficult to find many places in Great Britain where the National Physical Laboratory could do any great harm. I do not think there are many, but it is difficult to say.

1576. Do you think it is desirable that the National Physical Laboratory should take all testing work offered to it, or that it should refuse such testing as is now carried on by other bodies?—I think it ought to take all work offered to it. In my opinion the value of the National Physical Laboratory would be very much reduced if they had to pick and choose.

1577. Even the work of commercial or routine testing?—Absolutely, yes. They ought certainly to take it.

1578. Have you read the Report of the Treasury Committee on which the Laboratory was established?—Yes. I gave evidence, if I remember right, some years ago in connection with it, but I have not read the Report lately, although I know more or less the direction of it.

1579. The Report distinctly recommends that the work of testing materials now efficiently carried on at private establishments should not be undertaken by the National Physical Laboratory?—I think that is a mistake.

1580. You would prefer to extend the scope of the work distinctly to everything in the nature of testing that may be offered to them or that they may be asked to undertake?—Certainly. In that connection I would like even to extend it to such an extent that it should not be the National Physical Laboratory but it should be the National Laboratory. My remarks may be beyond the scope you have under consideration, but I want merely to convey a clear expression of my opinion.

1581. Might not that practically have the effect of squeezing out of existence the private testing establishments now existing?—I do not think so. The Laboratory cannot in fact undertake all the work that is done by other testing agencies. They can only take a portion of it, and, as far as my opinion is worth anything, it will only be a very small proportion of the whole.

1582. You do not think, even if the policy of the Laboratory was to follow the lines indicated by you, there would be the slightest chance of their displacing existing establishments?—Not at all, any more than in other directions the possession of an Arsenal by the Government interferes very much with private enterprise and the manufacture of similar things. I do not think it would do it any more harm than the possession of the Arsenal by the Government interferes with shipbuilding or gun making. The National Physical Laboratory in my view is a national thing, which cannot possibly do very much harm to private enterprise.

1583. Would you give any protection at all to private establishments by requiring, for instance, that the Laboratory should charge higher fees than are charged in such establishments?—Not necessarily. I think there might be some difficulty about that from the point of view of consulting engineers. If they wanted to get certain work done, they would probably have to pay higher fees to others than the National Physical Laboratory would charge, and it would be perhaps a disadvantage to them. My view is to trust the Managing Committee to decide what work shall be undertaken by the Laboratory and the fees to be charged, because a great many other points affect the question. For instance, the ways and means, which the Managing Committee only can judge of. They have to get a revenue of some sort, and they can only get it from the fees and Government grants, and it is a rather difficult thing to lay down any special law as to what fees shall be charged, because if an instruction of that sort were given to the Committee of the Laboratory, it might lead to them having a deficit at the end of the year, and the closing of the Laboratory unless the Government came to the rescue.

1584. (*Mr. Chalmers.*) How much are the fees that you are afraid of losing at the present moment? About £111?—It is something of that sort.

1585. Your fears have a slender foundation at the moment, you may be happy to observe?—Yes, at present.

1586. (*Chairman.*) Then with regard to the question of publication, do you think that the results of investigations undertaken at the request of private individuals, and paid for by private individuals, should necessarily be published?—No; I think not necessarily. My suggestion in that connection would be that the general rule should be that publication should take place unless the person who has paid for the information should make a specific request that it should not be published, rather than putting it the other way. I think perhaps it might be wiser to have the rule that publication takes place unless the person who pays the fees says no, but the Laboratory should have the power of doing certain work without publication.

1587. Would you leave that also to the discretion of the governing body?—I would, certainly.

1588. I think you make a suggestion here that one method of meeting the difficulty, a sort of compromise between publication and non-publication, would be publication without the name of the person paying for the investigation appearing?—Certainly. I think that is advisable, because in our case we might want certain work done, but we would not like to have our names connected with the doing of this work, because our competitors, if they saw our name, would probably pay more attention to the investigation than they would in other cases. Therefore I think it advisable to leave the option with the persons having the work done to say whether the publication of their names should be made or not.

1589. Then you think that the National Physical Laboratory should undertake all work submitted to it by private individuals which it is capable of undertaking, and that it should be at the discretion of the private individual at whose request the investigation is made, whether there should be any publication, and if so what?—Certainly.

1590. (*Sir John Wolfe-Barry.*) In the case of your experiment or investigation between gutta-percha and balata, was that made public?—In part. I believe some of the men who were carrying on the experiments had permission to read papers. I cannot exactly quote directly, but I think Dr. Caspari read a paper at the Institute of Chemical Industry or one of the chemical societies. It is published in the proceedings there.

1591. Did he make the experiments?—He was the man who carried out the experiments. He made them partly at our works and partly at the National Physical Laboratory.

1592. Then was your permission asked before publication?—Yes, it was asked and I had some difficulty in deciding what to do. Anyhow, we granted permission.

1593. But in the records of the Laboratory as to work done the experiments did not appear?—Partially. The chemical work was published in the Chemical Society's proceedings, and the electrical work I think was actually in the report of the Laboratory.

1594. You would be in favour of there being no restriction on the National Physical Laboratory either in physical questions or any chemical questions?—Perfectly. I would prefer, if it were possible to do it, that it should be a National Laboratory, not a National Physical Laboratory only, but a National Chemical Laboratory as well.

1595. The two subjects must touch each other in many ways—physics and chemistry?—Certainly.

1596. (*Mr. Crossley.*) What do you mean quite by the phrase "the personal element" in your second clause?—In this way, that if a company for instance want to get the value that must attach itself to the name of a prominent man for reports or otherwise, that I call the personal element. For instance, a consulting engineer can make his report on data which he might obtain from the National Physical Laboratory and that would be of value, whereas the National Physical Laboratory's certificate in all probability could not be made use of to make the evidence more believable in certain directions. Is my explanation quite clear?

1597. Yes, I see what you mean. I thought, perhaps, that you meant this, that on the sort of understanding that a barrister puts forward only the side of the case that he is expected to put forward, when one goes to an ordinary laboratory one might expect them to represent one's views in their report; but here that element would be absent, and it would be an exactly true and impartial report that would be given?—That is also partially my meaning. It would be rather a difficult thing, for instance for anybody connected with the Laboratory to be a witness for one side or the other.

1598. Would you exact a higher fee for results withheld from the public than for those that were published ?—I think so. That could be done. I would not object.

1599. I look at it in this way, that on the ground that the Laboratory was giving valuable public information, perhaps a less fee might be charged for results that might be freely published for the benefit of the public, whereas if those results were to be kept quite private for the benefit of the individual, it would be only fair to make him pay more. Would you think that a fair thing ?—Yes, I think that is quite right.

1600. (*Sir Andrew Noble.*) You are aware, I suppose, that in all the considerable engine ring works, and even in inconsiderable engineering works in this country, what is called routine testing is done by these firms ?—Yes.

1601. And, in the case of engineering, engineers generally send to these firms their own inspectors to see the routine tests carried out ?—Yes.

1602. Do you think it would be a hardship if these firms were precluded from carrying any question to the National Physical Laboratory upon which there might be doubt to be decided ?—As far as opinion goes that is to a great extent a question of degree. There must be some damage done, but any evidence that I would like to lay before you gentlemen is that I think the damage would be so slight that it is a quantity that ought not to be considered in a question of this sort.

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1603. Yes, but my point is that both as regards chemical tests and as regards other tests there is sometimes a dispute arising, we will say with the Government for example, and one use of the National Physical Laboratory would be to settle these questions as to whether there had been any mistake, for instance, in the analysis ?—I do not think that that would be a proper position for the National Physical Laboratory to take, because it would bring the National Physical Laboratory forward as an arbiter, and while they might be of use to a Government Department, I do not think that they should step in in any way between two private individuals and practically settle the case. In a case of that sort, I suppose that if each party had had their expert witnesses, those two expert witnesses might use the National Physical Laboratory and then deal with the results in accordance with their views and interests.

1604. That would practically be the same thing ?—Yes, but then it would not mean bringing the National Physical Laboratory forward in any way into court or anything of that sort.

1605. No, I do not propose that ?—No, I do not suppose they would do that.

1606. (*Chairman.*) I take it you mean the National Physical Laboratory could usefully perform the duties of an arbitrator where both parties consented to refer the matter in dispute to the National Physical Laboratory ?—In that case I agree, certainly.

Mr. William Henry Maw, called and examined.

1607. (*Chairman.*) You are Past-President of the Institution of Mechanical Engineers and Past-President of the Royal Astronomical Society ?—Yes.

1608. And also the representative of the Institution of Mechanical Engineers on the Executive Committee of the National Physical Laboratory ?—Yes.

1609. As being on the Executive Committee you have come into somewhat close contact with the work of the Laboratory ?—Yes.

1610. Would you like to express any general opinion upon its quality and efficiency ?—I have a very high opinion of the quality of the work that has been done by the National Physical Laboratory, and a very high opinion of the adaptability of the staff to the requirements which from time to time arise. Much of the work done there has been done under considerable difficulty from want of means, and in the mechanical engineering department particularly, I think anyone who looks into the equipment will see how much is due to the work of the individual heads of departments there in devising special means of dealing with cases as they arise. A lot of quite special testing machinery has been designed and made at the Laboratory and there is abundant evidence that the staff there desire to do their very best under somewhat adverse circumstances.

1611. Do you think there is any danger of the work of the Laboratory interfering unduly with the business of other agencies ?—In reply to that question I should like to confine myself more to the mechanical engineering view of the question than to the electrical. As far as the mechanical engineering aspect of the question is concerned, I think that the work of the Laboratory tends to increase the amount of testing which will have to be done by other sources.

1612. Would you explain that, please ?—In the old days we were satisfied with some very crude tests of materials. The researches that have been carried out at Bushy and elsewhere show that the tests which are now required to give a true knowledge of materials are very much more complicated than those with which we were satisfied in the old days, and they also show the great necessity of these tests being carried out systematically. That means that a very large amount of testing is done nowadays that was never thought of by engineers 10 or 15 years ago, and that work must be done somewhere. A portion of it could be done at Bushy, but the tendency is to make engineers employ testing agencies more than they would have done if those researches had not been carried out. I think the private testing agencies have perhaps been more affected by the fact that nearly all steel works and nearly all railway companies now have their own testing stations. I remember very well in the old days the practice was to take samples of steel and have them tested at Kirkaldys, or at some of the private agencies; but nowadays, when dealing with large contracts the routine testing is done at the steel works, and you never think of going to private testing agencies except for dealing with check samples; the bulk of the testing it is done at the steel works. That affects the amount of work that is done at the private establishments. As I said just now, the railway companies have all got their own testing stations. The consequence is that the people who have the private testing stations have been affected by the work being done elsewhere.

Mr. W. H. Maw.

1613. In proportion as the work of testing becomes more difficult and elaborate, you think that the work of specialists in that branch of business is likely to be increased rather than diminished ?—Quite so.

1614. And in that way that indirectly the National Physical Laboratory will increase their work and not take away from it ?—Quite so. There is rather a special case which occurs to me just now. In the old days we used to think that if two samples of steel, for instance, gave the same tensile strength, the same elongation, and the same reduction of area at fracture, we might expect them to give very similar results in use. We know now that is not so, that if subjected to shock the result may be quite different; one may have far greater endurance than another. That fact has occasioned resort to the impact test—the sudden fracture of samples by a blow. The special features of that method of testing are now being worked out very carefully at the National Physical Laboratory, and I feel quite sure that within a short time, impact testing will be a standard type of testing. That means that the private testing establishments, if they are to fulfil the requirements of engineers, will have to fit up apparatus for that mode of testing. That will all be additional work.

1615. There will be so much the more room for specialists?—Yes.

1616. You do not think there is any fear that if every kind of commercial testing work is undertaken by the National Physical Laboratory they would squeeze out the specialists altogether ?—I do not think so in the least. The National Physical Laboratory is not a very accessible place for ordinary commercial testing, and there will always be a large number of customers who prefer going to the more convenient places in their neighbourhood.

1617. But on the whole you would be in favour of placing no restriction upon the National Physical Laboratory as to the testing work which it should undertake ?—I feel that very strongly.

1618. Would you leave it entirely to the Executive Committee to decide ?—Entirely.

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1619. But you would not go so far as to say it should be the duty of the Laboratory to undertake all work presented to it?—Well, within very large limits I should say so.

1620. That would take it out of the discretion of the Executive Committee?—I see your meaning. I think that there is very little work likely to be offered to it that the Committee would not accept. I put it in this way. I think it is very desirable that the officials of the National Physical Laboratory should have brought before them all classes of commercial testing that are likely to be required. I think they ought to be in constant touch with the manufacturers, and know just what materials are being offered to the public. The only way of getting such information is for them to have a pretty free hand in doing work that is offered to them.

1621. Would you give any protection to the private testing establishments by requiring that the Laboratory should charge higher fees?—I think there would be no objection to charging higher fees. As a matter of sentiment, I should rather the Laboratory did charge slightly higher fees, or even substantially higher fees, so that there might be no excuse whatever for any complaints on the part of private testing establishments that they were being underbidden.

1622. Then as to the question of the desirability of publishing the results of all investigations undertaken at the request of private individuals, what do you say?—That is a very difficult question, but I think it is absolutely necessary that there should be what I may call secrecy in very many cases.

1623. You mean absolutely necessary in this sense, that unless such secrecy were promised, there would be no applications made, or comparatively few applications made, to the Laboratory to undertake investigations?—That is so. The number of cases in which the Laboratory can give a definite reply to a definite question is comparatively small. In most cases of the kind you are speaking of now, the work would be the joint work of the manufacturer applying to the Laboratory and the officials of the Laboratory. A question might be put from a manufacturer to the Laboratory as to the effect of certain treatment of materials. That might lead to suggestions by the Laboratory officials that a better result could be got by another form of treatment. This is merely an illustration. That suggestion would have to be tested in the works, and possibly it would be found that some other mode of treatment would be better than the suggestion of the National Physical Laboratory officials. Eventually the matter would be worked out by the manufacturer and by the officials of the Laboratory jointly, so that the ultimate product would not be the property of the National Physical Laboratory.

1624. I quite see that difficulty. Does it not also tell the other way round. If the National Physical Laboratory undertakes an investigation at the request of a private firm, and is assisted by the knowledge acquired in connection with the subject by that firm, so that ultimately you have what you justly describe as a joint result, would not one consequence of that be, that if some rival manufacturer engaged upon the same or kindred researches was to come to the National Physical Laboratory and request them to make an investigation of an analogous character, they might be compelled to say, we cannot do that because it would involve our revealing to you that which we are bound to keep secret, the result of investigation undertaken at the request of somebody else?—A difficulty of that kind must arise in any consultative business. If you desired advice on some particular branch of engineering you would most likely go to a man who was known to be an authority on that particular branch. That man must necessarily have been in contact with a number of other persons before yourself, and his knowledge must necessarily have been acquired through having to deal with their requirements. You would have to trust to that consulting engineer to deal with you fairly in the matter; and I think it would be the same with the officials of the National Physical Laboratory.

1625. All those difficulties are got over if publication is made a condition?—Other difficulties would arise in their place which are perhaps more serious to the manufacturers.

1626. You mean that secrecy is really itself the condition on which private individuals will come forward and request the particular investigation to be undertaken?—Yes. The Laboratory did some investigations for me quite lately; some troubles in connection with type metal used with some special casting machinery. In my particular case it was not a commercial question at all. I did not mind whether the Laboratory published the results or not, but facts were got out by their researches in combination with the work done at the place where the metal was used that would be very useful to type-founders and people of that kind, and if I had been a typefounder and had gone to the Laboratory for this information, I certainly should not have wished those facts published. In that particular case it was suggested that there should be certain treatment of this metal. It was perfectly successful on a small scale as done at the Laboratory, but it was not practicable to carry it out on a large scale. The enquiry arose in connection with the stereo plates for the *Daily Telegraph*. The amount to be dealt with there was some six or seven tons at a time, and the treatment that you could use in the Laboratory was not at all applicable to the large mass. But the hints we got from the Laboratory were suggestive, and enabled us to take another course of dealing with the matter, which promises to be successful.

1627. Have you any suggestions to make with respect to a possible enlargement of the scope of the Laboratory?—I do not think so, beyond a general suggestion. I think the Laboratory ought to be capable of taking up any work that is brought before it. I do not think any limit can be placed on the development of the Laboratory.

1628. So long as it keeps in touch with the manufacturing and industrial interests of the country it should be left to develop in whatever direction seems to be most useful?—Yes. That is one reason why I particularly desire it should not be limited in dealing with what has been called commercial work. It is only by being in touch with that commercial work that those responsible for the management of the Laboratory can ascertain what the requirements of the time are, and be prepared for them.

1629. Speaking generally, your view is that the Executive Committee of the Laboratory should have a free hand?—A free hand.

1630. (*Sir John Wolfe-Barry.*) Would your recommendations apply to chemical matters as well as to physical matters?—Yes. The Executive Committee is representative of chemical interests as well as other interests, and I would leave matters in the hands of the Executive Committee.

1631. (*Mr. Crossley.*) You would say, I suppose, that if not in touch with commercial work, ideas as to the direction in which research might go would hardly occur?—That is so. This impact test is a case in point. That is being worked at now. It is not in what I call the commercial stage yet, but the fact that in certain commercial work the necessity for other tests for steel has been discovered has led to this investigation being taken up at the Laboratory, and by the time that is perfected they will be able to carry out tests which will be of great commercial value. I might say, too, that we are continually getting new materials in engineering, and the modes of testing we use now for the present materials may not be at all applicable to those in use in a few years hence.

1632. (*Mr. Chalmers.*) Do I understand that you would put it that the testing of samples was the important thing to keep the institution in touch with the needs of commerce, or would you rather perhaps put it this way, that the important thing is that the Government of the institution should be representative of commercial needs?—I think the staff ought to be in touch with commercial needs. I do not think the Laboratory ought to go out of its way to endeavour to get a large number of commercial samples to test, but I do not think it ought to refuse those samples if they are offered to it.

1633. But as regards the important matter of research, that would depend largely, would it not, on having representative men on the Executive Committee, and otherwise, who would indicate the lines on which the institution should proceed?—That is so.

1634. That would of course be very much more important than any testing of samples to see if they were up to specification?—They are both important, but important in different senses.

1635. It is the man rather than the sample that is important, is it not?—I will put it this way. The necessity is that the staff of the Laboratory should be acquainted with the class of materials which are being used commercially, and with the defects of those materials, and they cannot secure that knowledge unless they have a very fair number of samples brought to them. The motor-car industry now is bringing into use a great number of classes of steel which were hardly thought of a few years ago. This means that the task of arriving at a true idea of those materials necessitates a certain

amount of research, and if those materials were not brought to the Laboratory the attention of the officers of the Laboratory would not be drawn to the necessities of the case at all.

1636. (*Sir Andrew Noble.*) As regards publication, if an investigator paid the full expense of the investigation and desired that it should not be immediately published, would you consider that a certain number of years might be allowed to elapse before publication was made?—You mean that he should have the control of the publication up to a certain time, and after that time he should cease to have the copyright, if I may so call it?

1637. Just so; if, say, seven or 10 years was named, when he has paid for the complete investigation and he wished it not to be published, that would be reasonable?—I think there would be no objection to that course. The only thing is this, that if it was a long period—and it would have to be a long period I think—the facts would cease to be of value to the public, and they might not be worth the expense of publication.

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1638. Do you think that many investigators would come to the National Physical Laboratory and pay the expense, if it were to be made public immediately?—No, I certainly do not think so. I think there are a very large number of cases where the work of the Laboratory would be absolutely stopped by the knowledge that the publication would take place, even within a year or two

NINTH DAY.

Friday, 28th June, 1907.

PRESENT:

The Right Hon. GERALD W. BALFOUR (*Chairman*).

Sir ANDREW NOBLE, Bart., K.C.B.
Sir JOHN WOLFE-BARRY, K.C.B.
Mr. W. J. CROSSLEY, M.P.
Mr. ROBERT CHALMERS, C.B.
Mr. G. C. UPCOTT (*Secretary*).

The Right Hon. The Lord RAYLEIGH, O.M., D.C.L., called and examined.

1639. (*Chairman.*) Lord Rayleigh, you have been connected with the National Physical Laboratory from the time of the first Treasury Committee up to now?—Yes, I served on the Treasury Committee. It is true I was away part of the time that the meetings were held, but I was the nominal chairman of it. I was concerned in the drafting of the Report, and I have been on the Executive Committee ever since.

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1640. The Executive Committee consisted largely of gentlemen who had already served upon the Treasury Committee?—Yes, very considerably.

1641. Therefore any interpretation which they may have placed upon the Report of the Treasury Committee should be regarded, to some extent at all events, as authoritative?—I should think the Executive Committee must all along have known what was in the mind of the original Treasury Committee.

1642. Do you consider that the practice of the Laboratory, especially in regard to the testing of materials, has, as a matter of fact, observed the letter and the spirit of the recommendations of the Treasury Committee?—I am not so sure about the letter. I think it has observed the spirit, except perhaps in some very small matters. I think the letter is a little ambiguous.

1643. You suggest here that it would have been possible to aim at a purely Research Laboratory to investigate matters of scientific or technical importance, but that the actual Laboratory was founded as an extension of Kew, where ordinary routine tests had always been the main feature?—That was so. I think some of those who originally urged the institution of a National Physical Laboratory had rather the other ideal in their minds, that it should be a place for research of interest both purely scientific and also of industrial importance; and it would have been possible, I think, to institute a Laboratory on that basis. It would, I suppose, have required a much larger grant from public funds.

1644. The money received from fees up to the present time has, I think, been as to nine-tenths or perhaps nineteen-twentieths of it, derived from the kind of testing which went on at Kew before the Laboratory was established; that is to say, the testing and verification of instruments?—Very largely indeed.

1645. And, extending that work to the testing of materials, did not the Treasury Committee lay down certain limitations that were to be observed in order to avoid trenching unduly upon the sphere of private enterprise?—I think the idea was that where materials, or even instruments for the matter of that, were being satisfactorily tested by private parties the Laboratory should not intervene, or at an rate not intervene in such a way as to cut down the fee of the testing.

1646. Should you not rather say that the Report of the Committee laid it down that they should not intervene, quite apart from any question of the amount of the fee?—I think there is one passage in the Report that bears that interpretation, but the actual recommendations at the end hardly seem to enforce that.

1647. As regards the actual practice of the Laboratory you fall back upon the ambiguity of the Report and say that the Report might have been interpreted in one way or in another way, but as a matter of fact the Laboratory authorities have interpreted it in one way, and in your opinion that way is the right way?—I think so; but I think to that ought to be added that the amount of testing work on materials has been very insignificant.

1648. It might be expected to increase largely in the future if no change were made in the practice of the Laboratory?—I think a distinction must be made there between work for the public departments and work for the general public. No doubt if the scheme of testing for the Indian Government is carried out it will mean the testing of materials on a considerable scale. But the Executive Committee took the view that in no case would that work have gone to private establishments. It was either the National Physical Laboratory or else some other establishment working directly under the India Office.

1649. The reasons which have actuated the authorities of the Laboratory in undertaking commercial work have, I understand, been twofold: first, in order to obtain the requisite funds for carrying on the work of the Laboratory; and, secondly, to give the necessary experience to their staff?—Yes, I think the second reason you have mentioned is of importance. As regards the first, I may perhaps say that in various correspondence with the Treasury it has rather been indicated to us that we must

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obtain the funds that were required, as far as possible, by means of fees. Perhaps that has pushed us a little in the direction of undertaking more than we might otherwise have done.

1650. So that if the Laboratory was now called upon to forego an increase of fees, which it had counted upon, you would be inclined to say that the nation should make that loss good?—I think it would be necessary.

1651. Would you give us your views as to the general efficiency of the National Physical Laboratory. Has it carried out satisfactorily the purposes for which it was instituted?—I think, so far as the scale upon which it has been founded and supported admit, the working has been very satisfactory. We certainly have got an admirable man as Director, and on him, no doubt, a large part of the efficiency depends. The staff, I think, too, under him has been quite efficient. Of course I am only very generally acquainted with a good deal of the work. Such parts of it as I am specially acquainted with I can speak very highly of; work in connection with the electrical standards for instance. A very elaborate research defining the ampere has just been finished, and a paper has been communicated to the Royal Society upon the subject which I have had an opportunity of seeing; and no doubt that problem has been treated in a very satisfactory way indeed.

1652. Was that a repetition of some experiments carried out by yourself some time ago at Cambridge?—In a sense a repetition. After an interval of 25 years one must of course expect that many improvements can be introduced, and they have been.

1653. (*Mr. Crossley.*) I should like to ask you if you think that commercial testing work should be abandoned, I mean with reference to non-Government work?—I think the difficulty that has been mentioned by the Chairman would arise in that case, that there might be a difficulty in keeping the staff sufficiently *au fait* with what is going on, so that if some special matter were referred to them, some reference testing, they might then have hardly the necessary experience to give a satisfactory report.

1654. Not even with the India Office practice work they would get?—If it came under the head of the work done for the India Office, if it involved tests similar to those conducted for the India Office, probably that objection would fall through.

1655. (*Chairman.*) Will you give us your views on the question of publication?—The question of publication comes before me in another capacity as President of the Royal Society. The foundation of institutions of the kind of the National Physical Laboratory, and of the Lister Institute I might include also, no doubt throws a great burden upon the funds of the Royal Society, if they are expected to publish the results of investigations undertaken at those institutions. To a considerable extent the Royal Society has done that in the past, and I think they would be quite willing to do it in the future so far as their funds admit. But it is becoming a very tight fit now, and we are considering whether or not any particular paper can be published by the Royal Society; the referees and the committee of papers have to consider very seriously the financial aspect of the matter.

1656. That is another aspect of the question of publication than that which we have had to consider here. The problem presented before us is this: In the Report of the Committee of 1898, where investigation was undertaken at the suggestion of a private individual and paid for by a private individual, publication of the results was to be the rule, although a certain discretion was left to the Executive Committee to make exceptions in particular cases. We have had a great deal of evidence given before us that, unless the authorities of the Laboratory are prepared to relax the stringency of this requirement, very few applications for investigations of that character will be made at all?—I think I misunderstood your question in reference to publication. No doubt it is a very important matter. So far as I have observed on the Executive Committee, it is certainly the case that a large number of investigations that we might otherwise have undertaken would not be committed to us if there was an obligation to publish. Perhaps the best illustration of that is the case of the proposed institution of a naval tank for experiments upon models of ships. That did not eventually work out. It was much discussed, and at one time there was a considerable prospect of such a tank being made, at the expense largely, I think, of the Institute of Naval Architects, and of private shipowners and naval architects. If that tank had ever been made and got to work, it would have been an absolute necessity that the results obtained on the trials of any particular model, forwarded by any naval architect or shipbuilding firm, should be kept secret; otherwise no work would have come at all.

1657. Was it the apprehension of publication that prevented this tank being erected?—No, I think other difficulties intervened. I think it was always taken for granted that the results would be kept private.

1658. Do you think the Committee of 1898, in requiring that publication should be the rule and secrecy the exception, were going too far?—I think not as regards what they had in view at that time. The question of a naval tank arose later.

1659. Would you suggest any relaxation of the principle laid down by the Committee?—You mean that a larger number of exceptions should be contemplated? I think so. As to the necessity of publication, perhaps I might remark that some, I think, of those who have complained to us, and possibly to this Committee, have almost laid it down as a criterion of the kind of work that a National Physical Laboratory ought to do; that if it had not sufficient scientific interest to justify publication, that would be a proof that it should not have been undertaken at all. Of course such a criterion as that would cut at the root of nearly all the work done at Kew. The testing of a watch or a thermometer has no interest that would bear publication.

1660. (*Sir Andrew Noble.*) The only point, I think, on which I have to ask you is whether you consider that there are a great many questions which private firms could not carry out. If they are prepared to pay all the expenses of these researches it seems to me it would be unreasonable to publish the results at once, and I should like to know whether you think publication might be compulsory, but a certain number of years might be given before that publication was made; just, for example, as at present with patents—people are prevented for using an invention for 14 years, and then it becomes public property?—I think the embargo on publication might very well be removed after an interval of time, if the result still had a sufficient interest for publication.

1661. Do you think that private firms who want expensive experiments to be carried out by the National Physical Laboratory would send any, or but few, to the National Physical Laboratory, if the researches for which they paid were to be made immediately public?—In many cases it would be an absolute bar; and in the general interest of the country and of trade it would seem very desirable that the National Physical Laboratory should be free to undertake that kind of work wholly at the expense of the party who applies, and that in such a case the results should be withheld from publication, at any rate for a time.

1662. Do you think that both the question of publication, and the number of years to be allotted, might be left to the Executive Committee of the National Physical Laboratory?—I think it might. We have on the Executive Committee men well qualified to deal with the various aspects of all these questions.

1663. (*Sir John Wolfe-Barry.*) On the other hand, I suppose there would always be a large amount of work of a very interesting character, which could be published?—Certainly.

Mr. Hay Frederick Donaldson, called and examined.

Mr. H. F. Donaldson.

1664. (*Chairman.*) You are the Chief Superintendent of the Ordnance Factories at Woolwich?—Yes.

1665. You have had considerable experience, I think, of the work of the National Physical Laboratory?—Yes, I think I might say almost ever since it was started.

1666. Do you care to express a general opinion as to the character and efficiency of that work?—So far as my experience goes it is excellent.

1667. Following the order of your *précis*, would you tell us what those matters are in which the assistance of

the National Physical Laboratory has been invited by the Ordnance Factory?—To begin with, my first association was in connection with a corrected leading screw, which was required, not only for ourselves, but for gunmakers generally, with a view to getting more readily interchangeability of breech mechanisms and breech screws generally. On a committee which was appointed to consider that question, the Director of the National Physical Laboratory was nominated as a member, and his assistance, and the assistance in measurements which were necessary in coming to a decision as to the design of the machine and in checking portions of screws which were made in the Ordnance Factories for the purpose of being checked, were of the utmost importance, and the work done, I think, left little to be desired. The War Department subsequently came to the conclusion that Woolwich was not a proper place to locate this very fine machine which they had made, owing to the vibrations, and the machine was located in a building erected at the War Department's expense, at the National Physical Laboratory, and is there still ready for use, not only for Government purposes, but for anybody who desires to have leading screws corrected to a standard for their workshop use.

1668. That instrument was presented to the Laboratory by the War Department?—Yes, building and all.

1669. For general use?—Yes, for general use. Then we have invited the National Physical Laboratory to do a quantity of check work in measurements of gauges made by ourselves and for ourselves, made by outside firms, and for either ourselves or other departments of State. The India Office, for instance, I think had some inch length pieces made, and those were accepted, subject to a certificate from the National Physical Laboratory. Our own work, where I have thought it desirable that we should be extra accurate, though measured by our own machines and by our own people, has also been check-measured by the National Physical Laboratory. Another leading feature, I think, because it is of general interest, is, that we have invited them to check the critical points of various descriptions of steel, that is for comparison with similar tests which we have made for ourselves, using them, therefore, as a check upon our own work.

1670. Most of the work you have described would naturally come under the heading of standardisation and verification?—Yes. I do not know that the last would quite. Yes, it would come under the head of standardisation. It might be taken as research or as standardisation, because it is a little bit of both.

1671. Is that work of a kind which you could have given to private investigators with satisfactory results?—I suppose we could have, but we should not have—at least I think I am right in saying we should not have. In the absence of the National Physical Laboratory we should have stuck to our own.

1672. You are probably aware that the difficulties which we have had to consider have arisen principally in connection with the alleged invasion of the province of private enterprise?—Yes, so I understand from the papers. I suppose that the other instance which I have quoted would go to cover that sort of thing rather more, that is, work done for the Engineering Standards Committees of different sorts. The National Physical Laboratory has done an immense amount of work for the Committee over which I have had the honour to preside—the Screw Threads Limit Gauge Committee—and there, I suppose, it would be possible to say that that was work which private establishments might have done.

1673. I do not think that, as a matter of fact, we have had any complaints of that sort. The principal subject of complaint before us has been in connection with the ordinary commercial testing of samples. Have you any views with regard to that?—I suppose lamp testing would come under that head. We have certainly used the National Physical Laboratory for electric lamp testing.

1674. There are private establishments which do the work of lamp testing, I think, are there not?—Yes, but there again, as a Government Department, I doubt very much whether we should have called in any private establishment. We should have evolved our own tests for ourselves, and carried them out.

1675. (*Mr. Chalmers.*) It is very awkward for you to go to private individuals for that sort of thing, is it not?—Very.

1676. It gives them a cachet which you scarcely like to give them?—Quite.

1677. (*Chairman.*) Do you think the argument urged on behalf of the authorities of the National Physical Laboratory, that in order to carry out research work successfully it is necessary that they should be in close contact with commercial work, is a valid argument?—That they should be in close touch with a quantity of work, yes. But if you earmark it to commercial work I am not quite sure that I am prepared to go so far as that. It seems to me absolutely essential that, if the National Physical Laboratory is going to be most efficient, it must have a great variety and a great quantity of work, because in work such as that I have in my mind—delicate measurements and so forth—practice, according to my ideas, is of the very utmost importance; practice in manipulation, I mean. The amount of work which is required for that of course would vary with different individuals, but that the work should be forthcoming, I think, is in the interests of the National Physical Laboratory. To call it commercial testing I think perhaps is rather a misnomer, because there should I think be sufficient work in the country to give enough for what I would call check measurements. I am directing my attention for the moment to measurements, merely as an example, but the same would apply to any other investigation.

1678. Reference tests?—Reference tests, exactly.

1679. You do not think it would be necessary, or perhaps desirable even, for the National Physical Laboratory to cater for the ordinary routine testing work done by such establishments as Kirkaldy's, for instance?—I think they should not refuse to take anything that comes to them. I am not altogether sure that it is sound to circulate, if I may so call it, a price list for commercial work, properly so called.

1680. Your view is that if such work is pressed on them they ought to be allowed to take it?—Yes, certainly.

1681. But that they should not be allowed to run after it?—Yes. I do not quite see that there is the object. The National Physical Laboratory ought, by the excellence of its work, to be able to bring its own work, without having to circularise people for it, and moreover I think, if it was called reference work, half the complaints would drop.

1682. Have you anything to say on the question of compulsory publication of the results of investigations undertaken by private persons and at their expense?—I think that publication, where it is going to be of any use at all, should take place as a matter of course.

1683. Yes, but do you think that the Laboratory should be debarred from undertaking investigations, which they would not be asked to undertake unless secrecy was promised?—I think they should not be debarred from taking such work, but if there are to be any conditions as to secrecy, then I think the person asking for the work to be done should pay a very much higher fee for it, because, after all, as I understand it, the National Physical Laboratory is for the public good, and therefore any advantage got by any of its investigations should be for the benefit of the public, and therefore it should be published. I would not debar them from taking that secret work, but I would make it at such a cost as to uphold the value which some of us believe the investigations of the National Physical Laboratory have. I would not debar them from taking anything, but I think I would make the scale of fees entirely different for that sort of work.

1684. Would you leave it to the Executive Committee to decide what work is to be undertaken, and what was to be refused?—Yes. Might I add one thing? Supposing it was undertaken as secret work, then under no circumstances, either then or at any other time, should it be used for company promoting. The National Physical Laboratory should not be brought in as a supporter in any sense of any company promotion.

1685. (*Mr. Chalmers.*) For advertising people?—Yes.

1686. (*Chairman.*) You mean that the Executive Committee ought to make it a condition that any results of investigations should not be used for that purpose?—I do not say they should not be used, but they should not be quoted as emanating from the National Physical Laboratory. They might say that they have discovered so and so, such and such new features, but I do not think they ought to be allowed to bring in the National Physical Laboratory to bless their scheme. I think it would ultimately be almost fatal to the National Physical Laboratory's future usefulness if that was permitted.

1687. (*Sir John Wolfe-Barry.*) To follow that out, take a concrete instance: Supposing there was some

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new alloy which gave very high tensile results, and those results were tested at the National Physical Laboratory, and a certificate given, would not you say that must not be published?—I should say that it must not be published by the people who ask for it, unless it should be also published in the Year Book of the National Physical Laboratory.

1688. I see your distinction, but you would not debar it from becoming public knowledge?—No. So long as the secrecy is removed by the clients, if I may call them so, and the publication is made in the Year Book of the Laboratory, then I do not see any objection to the secrecy being removed by the people themselves, and used in their publications. But I do not think that the National Physical Laboratory should appear on a prospectus as having certified to the advantages or disadvantages of any particular thing for prospectus purposes.

1689. They would certify, I take it, not advantages or disadvantages, but certain physical facts?—Yes.

1690. (*Mr. Chalmers.*) If names were omitted would not that meet your point?—Certainly. I do not mind the matter, provided the National Physical Laboratory is not weakened as a public institution by being used for private ends.

1691. (*Sir John Wolfe-Barry.*) I do not quite see, if the National Physical Laboratory is to conduct an investigation at the expense of other people, in order to attain certain physical knowledge, why that should not be certified to. We will assume that some man makes an invention and he wants to know the physical results of that invention. He thinks the highest authority in England would be the investigation of the National Physical Laboratory, and, after paying all the expense, those results are obtained, and are they to be of no use to him at all?—I do not say that at all, if the National Physical Laboratory may publish them.

1692. I see that point. You do not object, as long as it is public all round?—No, but I think under those circumstances the National Physical Laboratory ought to come in first with their publication.

1693. You think it should be public all round?—Certainly, and I think it rather important that the publication should come first from the National Physical Laboratory.

1694. When it is going to be published at all it should be published in their Year Book?—Yes, and should not be in the prospectus until it is published in the Year Book, then it is a quotation from the Year Book which is public property.

1695. That should be, you think, in the discretion of the Executive Committee?—Yes.

1696. And you have sufficient confidence in the Executive Committee to leave them to make such conditions?—Certainly.

1697. With regard to commercial testing, I suppose it is true that what is commercially attainable in samples is varying considerably as the years go on?—I am not quite sure that I follow the question.

1698. Take the question of steel. What is commercially attainable now is very different from what it was years ago?—Undoubtedly.

1699. And that is continually altering from various causes?—Yes.

1700. And a great deal of this work has become now microscopic investigation?—Yes.

1701. Then is it not right to say that, unless people see a good deal of what is commercially supplied, they would rather lose touch of commercial interests?—Undoubtedly. That is what I meant when I was answering the Chairman just now. I would not go so far as to use the words "commercial testing."

1702. I use the phrase "commercial testing" because it is in the conclusions of the original Committee?—I see.

1703. I may take it, then, that your view is, that it is very desirable that the National Physical Laboratory should by usage in the matter become well acquainted with what is commercially required and commercially obtainable?—In my opinion if they are not so, they will cease to be useful altogether.

1704. (*Mr. Crossley.*) I would like to point out this one thing. You say here, "the reason for this being that certificates from an institution such as the National Physical Laboratory should be of greater value to the private manufacturer," so that I think you do say that certificates could be given. Of course, if a certificate is given and not published, it is no use?—I grant you it is no public use if it is not used for publication purposes, but it may be of very great use to the people who have invited the investigation.

1705. (*Mr. Chalmers.*) As touching the difference between a Government department and a private individual, do you believe that to be a fundamental difference. This is what I want your opinion on. If the Committee of 1898 objected to the testing of commercial samples as done by private individuals being taken on by the new Laboratory, would you say that view at all precludes any Government department from going to the Laboratory?—Certainly not.

1706. You would draw a very distinct difference between private individuals going to the Laboratory with a bit of steel or yourself from the Factory?—Yes.

1707. Therefore, you would feel that should it be held that commercial testing ought not to be done for individuals, that would not preclude, say, the India Office from taking its work to the Laboratory?—No.

1708. And if the India Office did take its work to the National Physical Laboratory—take for instance Sir John's illustration of steel—that would give the Laboratory very great practice for steel rails and that sort of thing?—Yes, I am really not quite sure what amount it would mean in a year. I am not quite clear what the turn-over of the India Office is in a year.

1709. Take the testing of rails. That would give a considerable amount of practice?—For steel rails?

1710. Yes; take that for an instance, and similarly other things?—Similarly other things, yes.

1711. Take the other uses of steel; so far as the India Office had any big business that would give business to the Laboratory?—It would help towards it, undoubtedly.

1712. Then, too, if the Laboratory were, as you said, distinguished for its good work, and were therefore selected by individuals making contracts with one another for reference tests in case of a difference, that would of course increase their knowledge and their experience?—Yes.

1713. Is it quite the fact that the big researchers who have done very delicate measurements have had as a matter of fact any commercial samples to do to keep their hand in?—I should say they were doing nothing else.

1714. Commercial samples. I am speaking of the people who have actually succeeded in research work and in extending our knowledge. Those are not as a rule the people who are testing samples and seeing that they are up to specification?—I cannot put a name on to the individual.

1715. (*Mr. Crossley.*) Who does the Woolwich testing?—We have several metallurgical branches, one for each department, in fact, at the present time.

1716. (*Sir Andrew Noble.*) I want fully to understand your views about this commercial testing. Of course, I quite recognise that in the Arsenal you stand on a different footing, but what I want to know is this. All large producers of steel have their own tests generally; but do you consider it is of importance to the country that in a case of their wanting to know whether the results they have obtained are confirmed by the National Physical Laboratory they should be allowed to do so?—Undoubtedly.

1717. As you know, at present they are not allowed. Then would you make the same provision with regard to chemical tests, that, if there is a doubt as to a certain analysis, they should be allowed to send that analysis to the National Physical Laboratory, on the supposition that the National Physical Laboratory charged fees somewhat above what private people do?—I have not got the fees in my mind, but on the broad principle my answer is, yes.

1718. Then on another point that you touched upon, I will ask a preliminary question only for my own information. If a test of a leading screw is made that is wanted to be very accurate, do you generally get two leading screws?—Three.

1719. Then, of course, that is with the object that when you have any wear from its being used over a small portion of the leading screw you can put in a screw that you know is accurate?—Yes. Perhaps I might say that up to the present I have not got the new

screws corrected on this machine actually into operation, but the leading idea is that one should be in the machine, one out of the machine, one never in the machine, but kept by it for reference.

1720. Exactly. I need not say that our Openshaw establishment has been celebrated for many years in that respect?—Your Openshaw establishment made this machine.

1721. There is one other question I should like your opinion upon, and that is the question of publication. If a private, or in my own case what I might call a semi-private, firm wants a research carried on in the National Physical Laboratory, and is prepared to pay every expense, would you agree that this publication, say at the judgment of the Executive Committee, should be deferred for a certain number of years?—No, only until it has been published in the Year Book.

1722. (*Chairman.*) If secrecy was agreed to, might it not be agreed to for a limited number of years?—I should see no objection to limiting the period of secrecy at all.

1723. (*Sir Andrew Noble.*) Would you go further than that, because I do not suppose a private manufacturer would go to a considerable expense for a certain research, if he knew that it was immediately placed at the disposition of any outsider who paid nothing, and would you agree that just as you have patents kept for a certain number of years, so this should be, we will say at the option of the Executive Committee, kept for a certain number of years before publication? You might have experiments that cost some hundreds of pounds, or even thousands?—Yes. I should think that it would follow the nature of the fee paid. If, as in my suggestion, secret work is undertaken and the higher scale of fees is paid, that might quite rightly, I think, be limited in its effect to a certain number of years. There is one difficulty, it seems to me, arising out of that, and that is that the investigation may in itself last a great number of years, and the dating of the period of quiescence in the secrecy, if I may so call it, would be perhaps a little difficult. But, on the other hand, if it was undertaken by the National Physical Laboratory on the usual procedure, that is to say of publication as the work goes on, the private individual would be called upon to pay less.

1724. I can quite conceive that there might be many results that a private investigator would not mind being published. But would you agree that there would be a sufficient safeguard if the whole question, and the matter of the number of years, was left to the Executive Committee, who would judge each case by itself?—I should not see any objection at all to leaving it to the Executive Committee. That would make each case stand on its own bottom.

Mr. David Butler Butler, called and examined.

1725. (*Chairman.*) You are a past President of the Society of Engineers, an Associate Member of the Institution of Civil Engineers, and a Fellow of the Chemical Society?—Yes.

1726. Do you carry on Portland cement testing works and a chemical laboratory, which were established in 1877?—Yes.

1727. Where are your testing works?—41, Old Queen Street, Westminster. I may say I succeeded the late Mr. Faija.

1728. The larger part of your practice consists of the testing and analysis of Portland cement?—About 90 per cent.

1729. And the rest relates to the testing and analysis of constructive materials generally, such as bricks, limes, mortars, oils and metals?—Yes.

1730. Has your business been interfered with by the practice of the National Physical Laboratory?—I cannot say that it has as yet.

1731. You think it is threatening, however?—Very much.

1732. Contrary to the principles laid down by the Committee of 1898?—Yes. I think that is very clearly put in the Report there, in which they say, "It would neither be necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried on by private or other laboratories."

1733. There is another passage in the report to which you refer in your *précis*. I think it is the first sentence of paragraph 9. Would you read that?—Yes. The Committee likewise reported in paragraph 9 that "it would be of great benefit to trade if means were provided for the public testing of the quality of certain classes of materials." In that I quite concur.

1734. You concur with that, but how do you interpret it?—Such, for instance, as the best proportions and kind of aggregate to be used, referring particularly to cement work, etc., say, for instance, the best class of brickwork for certain purposes.

1735. You do not think that the sentence is connected with the sentence immediately following it: "In particular the Committee desire to draw attention to the evidence which has been laid before them as to the difficulties arising in certain Government Departments in their dealings with contractors, and others which might be overcome by the establishment of an independent testing authority." It seems to me that the emphasis there is on the word "public"—testing by a public authority in certain cases would be of advantage, and the Committee specially instance the cases where there is a dispute between contractors and a Government Department. Is not that so?—It may be so; but is not that rather making an interested party an arbitrator? You have a Government appointed official to arbitrate in a Government affair. This is a state-aided laboratory, or a public laboratory which is supported by Government.

1736. You do not think, as a matter of fact, it would be desirable that the National Physical Laboratory should undertake reference work where a Government Department is an interested party?—I think it is an interested party myself. It is unfair, it seems to me.

1737. You think the National Physical Laboratory would be partially disposed in favour of a Government Department?—I do. I think that clause refers not to one particular class of material but the value of various kinds of materials more to research work, I take it, than to actual public testing.

1738. Research testing?—Research testing as apart from commercial testing.

1739. You say here that you think the funds placed at the disposal of the National Physical Laboratory would be more properly applied in following the lines adopted by the American State laboratories, that is to say, in determining the constitution and properties of Portland cement and other kinds of materials.—Yes.

1740. Are you acquainted with the work of the American State laboratories?—No, except in that particular matter of cement and the ordinary building materials.

1741. Do they undertake any kind of commercial testing?—To the best of my belief they do not; it is entirely research work.

1742. You consider that ordinary commercial testing should be prohibited altogether?—I maintain it is quite contrary to the aims with which the Laboratory was established, first of all. It is expressly forbidden in this report.

1743. And on the merits of the case you agree with what you consider was the meaning of the Report of the Committee of 1898?—I maintain that the Committee of 1898 expressly points out that these investigations as regards the testing of materials are quite distinct from the ordinary testing of materials used in commerce or in construction and machinery, which can be and is now efficiently conducted at private establishments.

1744. And you think that the principles so laid down by the Committee of 1898 are sound principles that ought to be observed?—Certainly.

1745. (*Mr. Chalmers.*) In your objection to the testing of materials by the National Physical Laboratory, do I understand you to extend that to the use of the National Physical Laboratory by a Government Department in lieu of starting an establishment of its own?—Of course the Government Department does not affect me so much

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but it seems to me that that is covered by this clause in the Report.

1746. You would not allow a Government Department to go to the National Physical Laboratory; would you or would you not? Suppose the India Office wanted to have its samples tested by the National Physical Laboratory, would your general feeling compel you to say that they must not go there?—I do not like to object.

1747. A Government department going to a Government laboratory surely would not be quite the same, would it, as a Government laboratory undertaking business for private individuals?—No, not the same thing.

1748. You would feel there was considerable distinction in that?—Yes.

1749. (*Sir Andrew Noble.*) Supposing there was a dispute between a Government Department and a private manufacturer, do you think the Government Department would allow the case to go to a private individual?—I do not see why they should not.

1750. In your experience did you ever know of them doing it?—I do not know that there is anything in the Government way opposed to me, so I cannot say.

Dr. Richard Tetley Glazebrook, F.R.S., called and examined.

Dr. R. T. Glazebrook.

1751. (*Chairman.*) Dr. Glazebrook, you have had the opportunity of acquainting yourself with the evidence which has been given before the Committee so far, and will perhaps desire to offer any comments or criticisms upon that evidence, and also to supplement it on your own account with evidence additional to that which you gave on the first day of the Inquiry. I have here your *précis*, and perhaps the most convenient way will be to ask you to make statements under the various heads of that *précis seriatim*; first of all with regard to the work done by corresponding German institutions?—May I preface what I have to say by one point that is omitted in the *précis*. Questions have been asked as to the staff of the Laboratory, both in the evidence and when the Committee came down to see the Laboratory. I have prepared a full statement as to the staff, giving their previous qualifications, and I thought if that could go with the other statistics which have been sent in it might be of service.

As to the work done at corresponding German institutions, I would refer first to the Reichsanstalt, which is divided into two Divisions. Division I. deals practically solely with research work in physics. It is in effect an endowed institution for carrying on research in almost all branches of physics. The problems that are put before it are in great measure, no doubt, suggested by the work of the Second Division of the Reichsanstalt, which I shall come to, but still the work of the First Division is practically pure research. The Second Division of the Reichsanstalt deals with research in problems that arise from or are connected with industry, with a view to commercial requirements. These problems are the results of enquiries which are made by manufacturers and those who come and ask for the assistance of the Reichsanstalt. In addition to that, the Second Division of the Reichsanstalt deals with the testing of physical instruments, and materials that are used in physical instruments and in physical enquiries. In the other German institution—the Versuchsanstalt, which is now called the Material-prüfungs Amt—there is also research of a very varied character, in the main dealing with the requirements of engineers, metallurgists and chemists. Those researches are published in a long and very important series of Mittheilungen which appear in one to two volumes a year, and of which we have copies at the Laboratory; they have proved of great value to us in our work. The Mittheilungen are referred to, I notice, in the evidence of Sir Alexander Kennedy. In addition to that the Versuchsanstalt deals with tests of machines and materials of all kinds. I thought it desirable to make that clear, because once or twice it has appeared, I think, in the evidence that the idea prevailed that the Versuchsanstalt did not do very much research, but was practically or almost entirely a testing institution. Research is a very important portion of its work.

It seemed to me, on reading through the evidence, and giving what consideration I could to it, that the real question that is at issue now is whether the National Physical Laboratory in the future is to be organised on the lines of the Reichsanstalt First Division, doing research only, or on the lines of all three institutions that I have mentioned—the First Division of the Reichsanstalt, the Second Division of the Reichsanstalt, and the Material-prüfungs Amt. I felt that if that could once be settled the details of the matter would not give rise to very serious difficulty.

Of course, the main question is the question of interference with private interests. On reading through the evidence that you were good enough to allow me to see, it did not seem to me that there were many cases, if any, of serious interference with private interests which had been proved, and I think the policy of the Executive Committee has been in the past, and I am confident it would be in the future, to avoid that interference as far as possible. But, of course, it might be argued that it was better to limit the work to research pure and simple. In the first place I do not think that would be carrying out the ideas of the gentlemen to whose action the establishment of the National Physical Laboratory was due in the first instance, and in the second place I doubt very much whether a purely research establishment, established at Teddington, isolated as it would be then from contact with manufacturers and with practical life, and also isolated from academic influence, would be at all the best way of establishing a research laboratory. I should very much prefer to see considerable sums given to someone like Professor J. J. Thomson at Cambridge, or Professor Sir William Ramsay in London, who have shown they can organise round themselves large and important research schools, and who have the advantages that are offered by a large school of pupils rather than to a Laboratory, isolated as it would be at Bushy. If the work is to go on at all at Bushy, I am confident that it must be very closely connected with industry and practical work, as has been the case in the past. That has been the view of the Executive Committee. I think the Committee has had copies of this Memorandum on the future organisation and expenditure of the Laboratory, which was presented to the Treasury in February, 1904. The Memorandum starts with an account of the German, French and American institutions to which reference has already been made, and then on page 4 it goes on to say: "It is important to notice that in the National Physical Laboratory an attempt is made to cover, with some exceptions*, the whole of the work of the Reichsanstalt and the Versuchsanstalt at Berlin, or of the two Laboratories in Paris." (The Memorandum explains that there are two Laboratories in Paris which deal with this work.) That is a claim on the part of the Committee of 1904 to cover the work of the Versuchsanstalt and also the work of the Reichsanstalt. I think at the time the Committee made that claim they felt that it was a large claim; and they concluded their Report by saying: "In view of these facts, the Committee desire very earnestly to request that the Lords Commissioners of His Majesty's Treasury will carefully consider the work and organisation of the National Physical Laboratory, with a view to laying down the lines that ought to be followed in the future, and to placing the Laboratory in a position to do its National work, and for this purpose will" make certain grants. The point I want to bring to your notice now is that the Committee of the Laboratory at that time had in view this definite scheme of work, covering in the main the objects of the Versuchsanstalt and the Reichsanstalt and the two French Laboratories, and distinctly asked for the assistance of the Government in carrying out that work. As I think the Committee are aware, the reply to that document which was made by the Treasury was a considerable increase of the grant, and in particular a large grant for buildings, which enabled the buildings that the Committee saw the other day to be erected. I may say that those buildings have been planned and designed entirely with the idea of carrying out these

* These exceptions relate mainly to the ordinary chemical analyses.

three branches of work—physical research of a high character, physical research distinctly bearing on engineering and mechanical problems, and testing work.

1752. With regard to the first of those I do not think any question has arisen in the course of the evidence at all. Everybody is agreed that such research work is appropriate for the Laboratory to undertake. With regard to your second head—research work connected with industry—the only important question which has arisen is as to whether publication should or should not be compulsory. It is with regard to the third head that we have heard the greatest number of complaints. The third head I understand to be practically the commercial testing of materials. Is not that so?—I think so; not only materials, but instruments.

1753. With regard to instruments comparatively few complaints have been submitted to us. It is, I think, hardly necessary to go into the question of the testing and verification of instruments. The two main points really are how far, if at all, the Laboratory should be permitted to undertake ordinary commercial or routine testing of materials, and how far, if at all, the principle which the Committee of 1898 laid down in connection with investigations undertaken at the instigation and expense of private persons, that publication should be the rule and secrecy the exception, should be relaxed?—Then, perhaps, I may pass on to what I have marked in my *précis* as Clause 3 without referring more to the scheme or plan for carrying out work under all these three heads. There are various other points that might arise under Clause 2 as to the importance of defining the scope of the work, but it is perhaps not necessary to refer to them.

1754. With respect to Clause 3, the possibility of combined test and research work; according to some of the witnesses, if the Laboratory undertakes the work of routine testing, that would prove prejudicial to its research work. Perhaps you will give some evidence on that point?—Certainly. I may take it, then, that except in that one particular it is not necessary to refer further to the evidence of Sir William Ramsay, Mr. Bagley, and Mr. Stead, who pressed that the Laboratory, as I understand, should be practically solely a research institution. As to the possibility of combining the work of test and research, I think in the first place that is proved by the examples of the Reichsanstalt and the Versuchsanstalt. They have existed for a long number of years. Their effect on German industry has been very marked and generally recognised, and there is no doubt that they combine both research and test work, the research being in the main, so far as the Versuchsanstalt is concerned, on problems directly bearing on industry. I think also that it is proved by our own experience. May I turn to page 17 of the statistics of the work of the Laboratory, which I handed in at the first meeting. It says on page 17, "The following table gives a list of members of the scientific staff in the Physics and Engineering Departments of the Laboratory, with an approximate statement of the time spent: (1) In organisation and installation of apparatus; (2) In research and maintenance of standards; (3) In the commercial testing of instruments and materials." I perhaps need not take all the names in detail. I may say the figures have been got together as carefully as we could from our books and records. The first column, Installation of Apparatus, etc., relates in many cases to research work, because the apparatus has to be installed for research work, though it often may be useful for test work afterwards. For example, the machines and new apparatus of Dr. Stanton for special new tests of materials would come in there. In Dr. Stanton's case it appears he has given 50 per cent. of his time to the installation of apparatus, 40 per cent. to research, and only 10 per cent. to test work. Mr. Jakeman gives 70 per cent of his time to research, and 30 to the installation of apparatus and test work. Mr. Bairstow practically gives all his time to research work. Dr. Carpenter estimated that he gave 75 per cent. of his time to research work. Mr. Smith estimates that he gives 90 per cent.; and taking the scientific staff through it appears that 29 per cent. of the time has been given to installation of apparatus, 49 per cent. to research, and 22 per cent. to test work.

1755. And some of the time given to test work has been given to the testing of instruments?—Certainly, a large proportion.

1756. I think, if I remember right, I asked you at our first sitting to endeavour to distinguish between the time that had been devoted to the testing of instruments and the time that had been devoted to the testing of materials. I do not know whether you found that practicable?—Not with very great accuracy; but, speaking with fair approximation and using the term "testing of materials" in its widest sense, *i.e.*, including electrical, magnetic, thermal, optical, metallurgical and metrological, as well as mechanical tests, perhaps 20 per cent. of the time given to test work is spent on testing materials. The average fees for this for three years have been £275, last year they were £111. Most of this work is not done, and cannot be done, elsewhere; taking, however, the more usual and limited sense of the phrase "testing of materials," *i.e.*, the ordinary tensile, compression, torsion and bending tests of materials of construction, the time spent has been quite small, some 4 per cent. or 5 per cent. of the whole. The fees for three years have averaged under £40, last year they came to £13.

1757. (*Mr. Chalmers*). For the testing of materials?—Yes. Then I have tried to urge that the combination of test and research work is desirable in order to keep assistants abreast of practice. I think perhaps what I have said on that point—I do not mean before this Committee, but in public previously—has been a little misunderstood. It has been spoken of as though I wanted to use this test work to train assistants. It is not so much, I think, a question of *training* the assistants. The assistants come to us very fairly qualified, and, except some few whom we train ourselves, they are completely trained. I think if the Committee will look at the qualifications of the staff they will realise that they were very high when they came to us. But what I urge is that, in order that the assistants may keep abreast of practical work, it is necessary for them to see something of the ordinary test work, and this also affords subjects for research. I quite admit that there may be difficulties in organising a staff to do test work and research work simultaneously, and I think probably those difficulties are greater in the case of chemical work than they are in the more physical or mechanical work. I noticed that two or three of the witnesses who have made that point have been gentlemen specially connected with chemistry, and a very large amount of routine chemical analysis (work which we do not do) is of course very deadening and very dulling; it would be difficult to expect a great deal of research work from a staff that were giving the larger portion of their time to purely routine chemical analyses. But we do not do this work, except of course for the Government. I am clear that the difficulties may be resolved by proper organisation; that by arranging, as I have I think arranged, that each scientific assistant has a piece of research work on hand in which he is interested, and for which in nearly all cases he is directly responsible to me, and about which he comes into continual contact with me, there is no real difficulty in organising the staff so as to do research work and also test work. Of course, for a great deal of the test work, observers and persons of a different class to that which I have called scientific assistants are employed. The list of the staff that I gave you does not include the observers at Kew, for example, who do all the testing of clinical thermometers, the ordinary meteorological instruments, and things of that kind. They are organised as a distinct staff from the scientific staff, who do both research work and test work.

Then, as to the details of some individual cases, Sir William Ramsay referred in particular to the case of Dr. Harker, and implied, I think, that too much of his time was occupied in very simple test work. I rather gathered that he was under the impression that Dr. Harker had something to do with the testing of clinical thermometers. Of course, if that was his impression, it is a completely mistaken one. Routine testing like that of clinical thermometers does not come into Dr. Harker's department at all, except so far as keeping the standards for that work is concerned, and of the importance of that I think there can be no doubt. Only three months ago, or perhaps six months ago, we received a letter from one of the largest makers of clinical thermometers in London telling us that he also has a large business with America, and that one of his standards which had been sent out to his agent in America had been proved, by comparison with the Bureau of Standards in America, to be appreciably out, and that in consequence he had received instructions from America to graduate all his future instruments for America in terms of this American standard and not our standard. Of course that was a point which Dr. Harker's skill and experience were wanted to elucidate. It ended in a correspondence between us and the Bureau of Standards, and, through the kindness of the chairman of the Cunard

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Line sending over by hand standards of a high class to America, finally there was a complete agreement with the results which we had originally arrived at and the American results of to-day, with the consequence that this maker is now free to send his wares as standardised by us to America as he was previously, instead of having to adopt the American standards. That was a matter, of course, of research connected with tests that nobody who had not the experience of a man like Dr. Harker could carry out. So, for instance, with those Féry pyrometers which are now coming in, and to which I called the attention of the Committee at the Laboratory.

1758. I think you may take it for granted that standardisation is accepted as proper work for the Laboratory to undertake. Nobody has disputed that?—As standardisation certainly, but I wanted to indicate the way in which that standardisation work was directly connected with the research and test work. It needed a considerable research to establish the proper methods for testing commercially these Féry pyrometers. I mentioned the matter to Dr. Harker, as his name had been specially mentioned, and he says quite clearly that he feels that for the research that we are expected to do, and that we do, the contact that is obtained with manufacturers and others through testing the materials that come to us is absolutely necessary. Of course, as I have already said, we could be organised as a research laboratory without that, doing quite different problems. I may perhaps give, as illustrating the importance of the test work, some evidence that came to me a few days ago from one of the senior assistants of the Material-prüfungs Amt who happened to visit the Laboratory; he said spontaneously himself that the establishment of the Laboratory had made a very serious difference in the amount of work that they at the Material-prüfungs Amt got from England.

I come now, if I may, to the question of publication, and I should say on this head that the publication of all work of general scientific interest ought always to be aimed at. There are no doubt some exceptions to such a rule. For instance, there is Government work. I will illustrate that in a few moments by a letter from Sir Benjamin Baker, dealing with certain Government work. We have a very large amount of Government work to do of various kinds, publication of all the details of which would not, I think, be desirable, although sometimes they may be of general scientific interest. But I should hope that it would be, as far as possible, the rule of the Laboratory that the publication of the results of work that was of general scientific interest should always be aimed at. On the other hand I should hope also that the Executive Committee might have a fairly free hand as to making exceptions to that general rule, and I think that the result would be that practically everything that was of real scientific interest would be published. That has been my experience, with some few exceptions, up to the present.

1759. Would that be the case even where the research has been initiated by private individuals?—I think the scientific results of the research would in general ultimately become public. If I may explain how that will work in, I will do so in a few moments. May I first, however, refer to the practice of other institutions? I think questions have been asked with regard to it. With regard to the first division of the Reichsanstalt, no work of this kind is done, and therefore the question does not arise. With regard to the work of the Material-prüfungs Amt, I have a letter from the Director, which was written partly in answer to an enquiry about this matter and partly in connection with the question as to how far assistants at our Laboratory, or at the Material-prüfungs Amt, or at the Reichsanstalt, or any institution of the kind, should be free to take out patents. I may say that question is being discussed in Germany, and I think in France at this time, and we have been in communication about it. This is an extract from a letter from the Director of the Material-prüfungs Amt: "The results (as laid down in the certificate) of tests made at the instigation and cost of a client are the absolute property of the client irrespective of whether they are utilised in connection with the taking of a patent or for other purposes. The members of the Material-prüfungs Amt are, of course, not allowed to take out a patent on the basis of these results which have been purchased by the client." The letter from the French Director, the Director of the Laboratoire d'Essais, is: "In all cases where the manufacturer pays the Laboratory for the researches to be undertaken the results of such researches are his own property, and neither the Laboratory nor any representative thereof can take out a patent in this connection." The Director of the Second Division of the Reichsanstalt writes: "The greater part of the work consists in the testing and certification of instruments, or the examination of materials, according to recognised methods, and in cases for which the necessary apparatus is available. If the test or investigation is one of general interest the Reichsanstalt may procure the apparatus required at its own cost. Investigations of the above character are carried out at fixed rates; the results are communicated to the person who asks for the investigation to be made, and not to anyone else unless he furnishes a written consent on the part of the former to the results being so communicated." So that in those three cases those results are strictly private, though, as I think, I shall show shortly, practically all real scientific results arising from them soon and very easily become public property. I may say that I have recently had a visit from Herr Lewald, the president of the governing body of the Reichsanstalt, and he said at once: "To be compelled to publish all our results would be to do away with a great part of our work, and work for which we were primarily instituted. Do you think that Herr——" —naming a very well-known manufacturer—"would ever have given us the facilities he has and allowed us to do that work if we had been compelled to publish everything?"

The present practice of the Laboratory is that all results, with some quite few exceptions, that are arrived at are to be published, and I think that has caused in the past a certain number of very considerable difficulties. Practically everything has been published. There is power reserved to the governing body not to publish, which has been exercised on one or two occasions, very few, but I believe it has been exercised on one or two. Practically everything has been published, and that by means of an arrangement of a friendly character come to with the person initiating the research and myself, and the Executive Committee of course. I have explained to an inquirer that the Executive Committee would request that any results of scientific interest should be published, but they have left it to some extent to the person who was initiating the research to give his permission later if that seemed necessary, and as a matter of fact in almost all cases that has worked; the permission has been given, and there has been no difficulty.

1760. Then I take it that in the practice of the Laboratory you have followed a very much narrower rule than that observed in the corresponding foreign institutions?—Up to the present we have done so.

1761. Do you think it desirable that your present rule should be relaxed?—I think most desirable. I am coming now, if I may, to some cases of real difficulty, to show how difficulties have arisen from the very rigid interpretation of the present rules. May I, in the first instance, refer to this letter of Sir Benjamin Baker's, as one that illustrates the difficulty. Sir Benjamin Baker sent to the Laboratory a piece of gun tube to be tested. It was a tube that had broken, or burst, or shown a tendency to bursting, and he wished to have the matter investigated. That pretty clearly was a matter that ought not to be published, and that has not been published. The work has only just been finished, and Sir Benjamin Baker's death has prevented the arrangements of publishing such part of it as might be public property being carried out. However, Sir Benjamin Baker's letter as to the report was: "I think the experiments and report a very interesting example of research work at the Physical Laboratory, which might well be put forward at the inquiry, either by myself, if I get back from Egypt in time, or by one of yourselves. I will see you as soon as I get back from Egypt, and in the meantime express my appreciation of the results of your work and that of Dr. Stanton and Mr. Rosenhain." That is one case in which real difficulties would arise if we were strictly compelled to publish. Lord Kelvin's opinion has been quoted once or twice in the course of the evidence as to the kind of work the Laboratory might undertake, and I think also with regard to this question of publication. He writes to me: "I do not think it would be at all right to require that all researches undertaken at private cost for private individuals or firms by the National Physical Laboratory should be published. To publish them all would uselessly increase the great amount of publication of researches, sometimes of little scientific importance, with which the public is at present flooded. When it seems likely to be beneficial to the public, and when the person or firm who pays the

expenses has no objection, I think the publication may properly be made."

As to examples of cases in which difficulty has arisen, I will refer in detail to two. I think one other, in which the difficulty was got over by the kindness of Mr. R. K. Gray, has already been mentioned, the enquiry into the properties of gutta percha, which was undertaken solely by Mr. R. K. Gray's firm, the Silvertown firm, and which led to results which he says have been of very great importance, but he put the results at the disposal of the Committee; a great deal of it has been published, and much more of it has been got ready for publication if opportunity offers. But that is a case in which if it had not been for Mr. Gray's action—he is a member of the Executive Committee—difficulties would have arisen. Another case in which difficulties have arisen is that which was mentioned, I think, by Sir Joseph Swan in his evidence. I should like, if I may, to read two or three sentences from Sir Joseph Swan's letter: "Having seen some of the results of the excellent research work done at the National Physical Laboratory in the discovery of improved means of producing high temperatures through the agency of electrically heated materials, and the good equipment of the Laboratory in personnel and apparatus for extended research in the same field, the question has occurred to me whether the Committee of the National Physical Laboratory would be agreeable to enter into any arrangement with me with the object of ascertaining the properties, electrical and general, of certain substances, more or less nearly related to the materials which have been examined in Dr. Harker's recent researches on high temperature furnaces, where physical properties, especially in relation to electrical conductivity, have not up to the present time been quite definitely ascertained. The substances I refer to are, generally speaking, the metals or metaloids of the more infusible earths, of which Thorium, Titanium and Tungsten would be types, and it might be desirable to extend the research so as to find the electrical properties of some of their compounds, particularly the carbides and oxides in a compact and filamentary form. A research such as I have indicated might, I think, be made to fall well within the scope of the aims of the National Physical Laboratory." That was an enquiry into the materials which are now being used for the newest forms of incandescent lamps; instead of the carbon filament lamp, the tungsten filament lamp and filaments of some other material are being used. It is an inquiry of the very greatest importance to the country. As a matter of fact the inquiry into the properties of some of these metals has since been taken up in Germany, and lamps which are likely to supplant in great measure the carbon filament lamp are being made in Germany, and imported from Germany in large quantities. It is quite probable that had we been able to take the research at that date the German work on these lamps would have been done here, and the advantages that have accrued from the introduction of the lamps would have belonged to us rather than to Germany. But Sir Joseph Swan went on: "The question I wish to put to the Committee is—would it be undertaken for, and at the expense of, a person with a commercial object, which would include the appropriation of, at least, the first fruits of the research, possibly by means of a patent or patents, but with the probability that the greater part of the results would be immediately available for publication, and it would be remembered that even the portion reserved would eventually become public property." When the matter first came before the Committee, they took the view that the question was of such importance that they would be justified in going on with it, acting under the clause which reserves certain rights and powers to them. It was Sir Joseph Swan's intention at first that the tests should be carried out with assistance from a company and worked for a company with which he is connected, and the negotiations occupied some little time. Finally he decided to take it up himself and to assist the Laboratory with his experience in the matter, and then he renewed his application in the form in which I have read it as a letter from himself. By that time, however, this question of publication had been raised in a somewhat acute form. It appeared probable that this Committee was to be appointed, and the Laboratory Committee decided that while so important a matter was under the consideration of this Committee it was not desirable for them to undertake the work, with the result that the work has not been undertaken, and some of the results I have no doubt we should have arrived at have been obtained in Germany. Of course, besides the financial result to Sir Joseph Swan, it has been a serious financial loss to ourselves, because the fees of this investigation would have been considerable, and would have been a considerable addition to our income.

There is another case which has happened in the course of the last few months. It is the case of a firm which is concerned in the manufacture of a certain definite alloy. I have the permission of the firm to bring the whole matter before the Committee, but I think perhaps I need not mention their names, though they did not ask that their name should not be mentioned. The manufacture of this alloy is carried out by comparatively few firms. It is made of certain substances, and the exact proportion in which they are mixed is a pure rule of thumb. The effect of altering the temperature at which they are mixed is not known. The effect of making small alterations in the composition is not known. The question as to whether, by keeping the temperatures more constant, or more uniform, a more uniform product could be secured, is at present unsettled. After a good deal of correspondence we wrote to them and we said that we could undertake "(1) Determination of the freezing points of the various alloys and of the temperature limits within which the metal may be kept for casting and other manipulations. (2) Determination of the temperature limits to be observed in melting and mixing the ingredients of the alloys, and the proper order and manner of mixing. Specifications of pyrometers, etc., required for working to these limits. (3) Enquiry as to the means for protecting the molten metal from excessive oxidation"—which causes considerable losses—"so as to lessen the production of dross—*i.e.*, provision of a suitable slag or flux, &c. (4) Enquiry as to the causes of variation in the quality of the alloy (*i.e.*, of the occasional occurrence of soft or brittle alloy) by means of chemical analysis, study of micro structure, and mechanical tests. (5) Examination of the mechanical properties of the most important alloys and of alloys of slightly varying composition, to determine the effects of such variations in composition as our analyses may show us to occur in practice." All that work we thought we could assist them in, and it would be of value; but I went on of course to say that the work would have to be treated as in the end belonging to the Laboratory and as being capable of publication. Negotiations went on for a little time longer, because they did not realise at first what was meant by publication. That matter had been referred to, I should say, at our first interview, but they had not clearly grasped it, and it was not really till the final letter was written, when I called their attention to it specially, that they realised what was meant by publication. Then I had a letter from them saying that the work we proposed to do would be of immense value to them, that they were quite prepared we should undertake it, that they were quite prepared to pay our fees—the fees had been mentioned, and were on a liberal scale—but of course if that were done it was useless to them unless the work was their own private property for some considerable time; and as a result the enquiry has fallen through. That enquiry would no doubt have answered some questions of interest to them, but it would also have been the basis of a complete scientific investigation of this type of alloy, and I have no doubt that in the course of a little time a scientific paper dealing with this type of alloy could have been written in which the results of this investigation were utilised, without, of course, very direct reference to this firm, or to their special objects, and that such a paper, when written, would have been of very great value. But that work has gone.

1762. (*Sir John Wolfe-Barry.*) Do you know where it went to?—I do not think there is anybody can do it.

1763. I did not know whether it had gone to Germany?—I am not aware. As a matter of fact I am wrong perhaps in saying it has gone, because I hope it may be standing over until this Committee has come to some conclusion. I was informed, though not exactly officially, that a large number of consulting chemists and others had been consulted before the firm came to us, and it was not work which they could undertake. It needs, as you see, a combination of chemistry, metallurgy, and engineering. As to the scheme of fees for work of this kind: what has been done hitherto has been to ask an ample fee for the time spent, some 25 to 30 per cent. over the time, money for out-of-pocket expenses, payment for all special apparatus purchased for the work (unless it happened that the apparatus was some which the Laboratory clearly wanted for other work afterwards, and in that case the Committee have sometimes borne a share of the expense), and on the top of that 15 per cent.

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on the whole to cover general expenses; and there has been no question about it.

1763A. (*Chairman.*) Do you think it would be reasonable to charge specially high fees in cases where secrecy was guaranteed?—I do not think there would be any difficulty in that at all.

1764. *(Mr. Chalmers.)* Suppose you had to-morrow the work you are referring to given to you, would you take on a new staff?—This work would probably have involved the appointment of an additional assistant.

1765. So that you would be able to earmark the cost of the labour certainly?—Yes.

1766. And it would not involve the withdrawal of any of your staff from any research work they were previously engaged on?—If any had been withdrawn that withdrawal would have been earmarked, but I do not think it would have meant the withdrawal of any of the research staff.

If I may pass on now to detailed objections to fees that have been mentioned, Sir William Ramsay and Professor Frankland objected to some detailed fees and handed in a paper which the Secretary was kind enough to let me have. In the engineering pamphlet, 1903 (quoting from the 1903 pamphlet which has been altered), it was stated that the fee for a single sample was 5s., this was raised in 1906 to 10s. 6d. Those facts are of course correct.

1767. (*Chairman.*) You are now dealing with the routine test of materials?—Yes, and objections to what is called undercutting. As I think I explained to the Committee at its first meeting, we only had a small 10-ton testing machine at that time: we were only able to break very small specimen wires, not to do any serious mechanical testing, and it did not seem unreasonable to charge a less fee than ordinary. Moreover, we were asked at that time by the engineer of the Manchester Steam Users' Association if we would do the reference tests for his boilers. In writing to us he said that the ordinary fee which he paid for these tests, which he wished us to do, was 5s. to 10s. 6d. But I am quite prepared to accept the proposition that 5s. is too small. It was altered in the 1906 pamphlet, and in special cases we charge now fees well above 10s. 6d. We have recently charged for a series of tests of special alloys at special temperatures £1 1s. 0d. apiece. The normal fee is 10s. 6d., but in special cases we charge extra. Then there was a question as to the determination of the calorific value of coal. It was said that the usual fee was £1 1s. 0d. and that we were charging 10s. 6d. We are not employing the usual apparatus. A very much simpler apparatus is now being used, one designed by a gentleman who is now a member of our staff, which leads to as good results; but the operation is in consequence of the simpler apparatus a very much less costly and difficult one than with the old apparatus. I am not sure that I knew that the usual fee was £1 1s. 0d.; but I thought the proper fee was 15s. There is no objection to raising it to £1 1s. 0d. or to the fees being as much or even more than the fees usually charged. Another point was the determination of percentage of ash in arc lamp carbons. I have not been able to find any particulars as to fees for that. This statement is that the usual fee is £1 1s. 0d., and we have been charging 10s. 6d. Then there was a question as to the determination of melting points, etc., and it is stated that the usual fee was £1 1s. 0d. and we were charging 10s. 6d. We are quite willing to make it £1 1s. 0d. Then "For cooling curves from 900 degrees Centigrade downwards the fee is £1 1s. 0d.; from 1,100 degrees Centigrade downwards the fee is £1 11s. 6d. The usual professional fee for the above is £3 3s. 0d. and upwards." I did not know there was a usual fee for that. I thought that perhaps with one exception, and that exception not a professional testing establishment at all but a university college, we were the only place in the country where these cooling curves were taken. If it be the case, as it appears from this, that the usual professional fee is in excess of what we charge, we do not at all wish to undercharge; but here again our fee is really ample for the time it takes and for the work. The main criticism that is raised in this paper with regard to fees is the question of the fees at Cooper's Hill, and that perhaps is a more serious one. I should like to explain as to the arrangements with the Indian Government for testing work at Cooper's Hill. When it was settled that Cooper's Hill was to be closed, the Indian Government authorities proposed to transfer the whole of their testing plant and appliances from Cooper's Hill to their Stores Department at Lambeth, and to employ members of their own staff—they would possibly have had to increase their staff—to do that testing work at their Stores Department at Lambeth. It was felt by the Committee of the Laboratory that there was a good deal to be said for concentrating such Government testing work, and a letter which I have here was written by Lord Rayleigh to the India Office dealing with that question. As the result of that letter and various interviews with the India Office authorities an arrangement was made whereby the apparatus should be transferred on loan to the National Physical Laboratory, and the experiments carried out there rather than in the India Office Stores Department at Lambeth. It was not a question of giving anything to or taking anything away from the professional analysts; it was merely a question of the India Office preferring to utilise the resources of the Laboratory rather than establish an independent testing station of their own in London. Then there came the question of the fees. I have the figures here. The fee formerly charged at Cooper's Hill for a complete test was £3 15s. 6d. That is allowing certain discounts.

1768. (*Sir John Wolfe-Barry.*) A complete test of what?—A complete chemical test of steel. I think it is only the steel tests that we are concerned with really. The India Office had the complete figures for many years' working at Cooper's Hill before them, they knew accurately the cost of the work, and they declined to pay fees to the Laboratory, or to anyone, which would realise a very large profit. They said that so long as the work had remained at Cooper's Hill it was practically paying out of one pocket into another. It was all an Indian Government Department; Cooper's Hill belonged to the Indian Government. They made an offer to the Laboratory to pay a reasonable profit on the actual cost, assuming the cost at the Laboratory remained the same as the cost at Cooper's Hill. They put at our disposal the figures of the cost at Cooper's Hill for a number of years, and we went into those carefully, and came to the conclusion that the cost at Cooper's Hill fairly represented what would be the cost at the Laboratory. I think there were one or two small items that ought to have been included. There was no item for cleaning of the rooms, and one or two small things like that. But they made an offer, as I say, to pay the Laboratory the actual cost, plus a balance which certainly will realise a very appreciable sum.

1769. (*Chairman.*) That estimate of cost would not include anything for depreciation of the instruments?—It did not include anything for depreciation of instruments, but it included such large renewals that it practically covered that. Nearly the whole of the cost is on the chemical testing. I am speaking of the fees for chemical testing. The depreciation on the glass and other apparatus which is used in chemical testing is practically destruction in a very short time, and there was ample provision for renewals.

1770. (*Mr. Crossley.*) Anything for rent?—Nothing for rent.

1771. There would be in a private establishment?—Yes. The Government then put at the disposal of the Laboratory Committee the whole of the apparatus, valued at £3,500, including the testing machine for its research work and other work that might be done at the Laboratory; and that is there on permanent loan, and is freely used by the Laboratory as well as for the Cooper's Hill work, paying us in addition a profit on the total cost of carrying out the work.

1772. (*Chairman.*) I think one of the witnesses complained to us that the fees charged by you for the work of the Indian Government would come to be regarded as a standard of comparison for fees elsewhere, and that the professional testers would be faced with the fees charged at Bushy, and their customers would insist upon a reduction?—Yes, I saw that point mentioned in the evidence and I feel that has appreciable weight. On the other hand it is the Indian Government who are having the work done, and they can fix, I take it, what they choose to pay for the work.

1773. And they are in this peculiar position, that they themselves have supplied the plant?—They themselves have supplied, and still own, the plant. There is no change, I think, to the outside testing establishment from what has been the practice for a long time, except for the interregnum that has occurred. There was a long delay in settling the future of Cooper's Hill, a delay of over a year. There was a scheme whereby Cooper's Hill and all its contents were to be taken over by the Royal Engineers, and pending the settlement of that the whole question of the transfer of the plant and what was to be done was held over. Meanwhile

Cooper's Hill was closed; there was no staff there, and something had to be done with the work, and during that period the work has been done by private testers in London, and of course now that it is, I take it, coming to the National Physical Laboratory there will be a change to them. But I think they have all of them known all along of the conditions under which they were doing the work for that year. The arrangements with the Laboratory were made long before the interregnum, and I think they have known thoroughly about the work.

May I pass on now to the next question of the detailed objections on the ground of chemical tests. I think that the Committee understand that the Laboratory generally do not undertake ordinary chemical tests. They have only done them in exceptional circumstances by way of special reference, or when they arose fairly and properly out of other work that was committed to them. Sir William Ramsay referred to one or two cases, and in particular to what is known as the cod liver oil case. The cod liver oil case arose out of an entire misapprehension on the part of myself and on the part of the persons through whom the difficulty arose. In the end of 1903 a bottle of cod liver oil was brought to the Laboratory to be tested, and I told the assistant, whose business it was to notify this to me, that we did not test cod liver oil or anything of that kind, and instructed him to write to this effect. Then I was told that the bottle had been brought in by one of the assistants of the Laboratory, who would like to see me before the letter declining it was finally written. I saw him, and found that a private friend of his, whom I also knew, had asked him as a favour to have this bottle of oil tested. It was explained to me, as I understood it, that it was a private matter, and the chemical assistant in charge was quite competent to do the work, I was asked, might that private test be made in a private way, and I, probably foolishly, said yes. I am sure that the man who sent it thought he was sending the oil to a regular official testing establishment. He had not any knowledge of the rules, and the assistant who received it understood that it was purely a private matter. Some months afterwards the man who had sent the bottle came to me, and I learned that he was connected with a chemical drug company, and that there had been some criticism by one of the local authorities as to the genuineness of this cod liver oil, and that he proposed to put the Laboratory certificate in evidence. I consulted the Chairman; the man had the Laboratory certificate, and it was agreed that he might put that in evidence.

1774. Was a charge made for this test?—A charge was made. That added to the difficulty. A charge had been made for the test, and having made the charge and given a formal certificate, it seemed necessary practically that he should be allowed to use it as evidence. I should say of course I reported the matter at once to the Chairman of the Laboratory Committee, and I also went at once to see Dr. Thorpe, because I understood that the matter would also come before him, and I explained exactly to him what the position was. When the case came up for trial it appeared that Dr. Thorpe's assistant had arrived at a different result. There was no real discrepancy, I am given to understand, between the two tests, but there was a discrepancy as to the interpretation. I understand that according to the Pharmacopœia a certain test as to its freezing-point has to be employed as the test of pure cod liver oil, and the oil in question did not satisfy that test. I think that was admitted, and it was held that, that being the test in the British Pharmacopœia, it settled the matter legally. The point that was raised by those who asserted the oil to be pure cod liver oil was that the freezing test is in certain cases a fallacious one, and that if the oil had been prepared at a somewhat higher temperature than the normal it would not freeze at the same temperature as if it had been prepared at the normal temperature. That was really the point of difference. This occurrence led to some correspondence with the Institute of Chemistry. Lord Rayleigh wrote and explained the position, and I saw one or two of the gentlemen connected with the matter, and I thought, and think still, we had satisfied all those who were really directly concerned. Lord Rayleigh explained, and quoted from the Laboratory pamphlet what exactly were the rules with regard to chemical tests, and concluded: "The Director wishes me to state that he is in entire agreement with those views, and that the special piece of work to which reference was made in your letter was undertaken by inadvertence in consequence of a misunderstanding on his part, and without any intention of contravening the above clause." A letter was received by Lord Rayleigh from the President of the Institute of Chemistry, and the whole matter appeared to be settled. You will perhaps remember, Sir, that at my first examination you asked me how it was that there were so many more chemical tests in 1905 than previously or lately. In April, 1905, a large number of letters of application were received asking that the Laboratory would undertake certain chemical tests. In all cases but one an answer was sent, enclosing maybe the test pamphlet, and saying, either directly or by reference to the pamphlet, that the Laboratory did not undertake chemical tests, except they arose properly out of physical and engineering work that had been submitted to them. Sometimes a mere reference was made to the test pamphlet in which the conditions were stated. One letter arrived when I was away, and as I explained the other day, when describing to the Committee our plan of working, a *précis* of the letter was sent down to the department concerned. The letter merely asked what were our fees for doing certain tests, and the assistant in charge replied stating what the fees were; that statement as to fees was sent to the applicant without any further statement, and I think without a copy of the pamphlet showing the conditions. It was assumed, I understand, that the conditions were generally known. As soon as I came back I noticed this letter, and what had been done, and I wrote at once to the man who had applied, stating what the conditions were, that the Laboratory did not undertake chemical tests except they arose out of physical and mechanical tests that had been submitted to them. My letter is: "In continuation of the correspondence with regard to the chemical analyses of brass, the Laboratory Committee are of opinion that at present we should not diverge from our practice of only making chemical analyses in cases in which materials are submitted to us for physical tests. Unless, therefore, you desire to have some of the physical qualities or properties of your brasses examined along with the chemical, we should not be able, as at present advised, to undertake the work." At the next meeting of the Committee I brought the whole question before the Committee, and suggested that possibly this large number of enquiries for chemical tests meant that there was some real demand, and that I had better, perhaps, consult the chemical members of the general Board, who formed a sort of chemical advising committee on the question; and I was instructed to do that. The first one of those to whom I went told me that he knew that this letter of the assistant was being circulated, together with another letter which merely said we enclosed this pamphlet without my explanatory letter, among the various institutions concerned with the Laboratory, with a view of starting an agitation on the ground of the Laboratory doing chemical tests. That has been the source of the agitation, and that is the reason why so many applications for chemical tests appear in 1905. Of course, I reported that fact to the Committee at the next meeting, and after that letters began to come in from the various institutions concerned complaining of this practice, and enclosing in particular the letter from my assistant without the explanatory letter from myself. As an outcome various interviews were held, and, as the Committee I think know, the terms relating to the undertaking of chemical analyses by the Committee were altered in the 1906 pamphlet, and have been very strictly adhered to since. The form of words used in that pamphlet was approved by the Council of the Society of Chemical Industry, and has been very strictly adhered to since; and I gather from the evidence that so long as the chemical work is limited to that, Sir William Ramsay, I think, and one or two others at any rate have said they do not see any serious difficulty. I wish to assure the Committee that there is no desire to modify this practice.

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I now come to a test for Mr. Blount which he quoted, on some copper, and there I think there is no doubt that I have to admit that, in one particular at any rate, the Laboratory result is erroneous. I have gone into the matter as carefully as I can. I should say that the assistant who did those tests is no longer a member of the Laboratory staff; he resigned some little time ago, but I have seen him and discussed the matter with him. The analysis is given on page 19 of Mr. Blount's evidence, and there are very considerable differences between us and Mr. Blount and Mr. Archbutt on the other side as to the proportions of arsenic, and antimony, and bismuth. There seems to be some reason for supposing that some of the differences may be due to differences in method. I do not want to press that point at all, but my chemical assistant at any

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rate would like to know the details of the methods before he would commit himself. With regard to the bismuth, he admits that he must, he fears, be wrong, and suggests as a reason that a certain solution which was used had been made up too long and was not re-tested, as it ought to have been, before being actually put into use. I am afraid I can only admit there that we have probably made a mistake. But I should like to call your attention to the whole matter. Mr. Blount wrote to us on the 23rd November, 1905: "Please make tensile test and analysis of the accompanying sample of copper." The Committee know we do not usually make chemical tests, and I wrote back: "Will you kindly supply us with fuller details as to the tests you wish us to make on the sample of copper sent. We do not make chemical analyses unless they are required to elucidate the results of mechanical or physical tests which we have undertaken. Ordinary commercial analyses are declined. As to the tensile test; if this means a complete examination, the determination of Young's Modulus, limit of elasticity, elongation, etc., we could do it for you, charging for the time required to prepare the bar." Mr. Blount wrote back: "I am obliged by your letter of Nov. 27th. I wish to compare the mechanical properties of the sample of copper with its chemical composition, and for that purpose desire to know its ultimate tensile strength, yield point, elongation and contraction of area, and its content of copper, arsenic, antimony, lead, bismuth, nickel, iron, and oxygen. I shall be glad to know whether you can undertake this work." I replied to that: "I have discussed yours of the 29th ultimo with my staff, and we are ready to make the tests you ask for. I must point out, however, that a test on a single specimen is not sufficient to afford a basis for comparison between the mechanical and chemical properties of the bar, but possibly you have already other information as to similar bars. I should also say that if results of general scientific interest are obtained we may ask your permission to publish them, and should inform you that, as I think you are aware, the conditions under which chemical tests are made are now under the consideration of the Committee." Mr. Blount, on receiving that analysis, sent a further one, which I declined, and the matter was ended.

I now come to Mr. Harrison's evidence, and in the first place to his criticism of a test on a certain lamp which was to be used as a standard lamp. He objected in the first instance to the fact that a lamp with a bayonet joint instead of a soldered connection had been used as a standard. We were perfectly well aware of the difficulty of using for standard purposes a lamp with a bayonet joint. Our own lamps all have soldered connections, and we should use only as standards lamps with soldered connections, but for a great many purposes the lamps with the bayonet joint are very much more convenient. To use a soldered connection means that you must have a special fitting on your testing bench for that purpose, one that will be of no use for the ordinary lamps when you come to test them; and in a very great many cases it is a matter of extreme inconvenience to use the soldered connection. The consequence is that Professor Fleming, who designed the lamps, and the Ediswan Company, who make them, rather prefer to issue them or at any rate generally do issue them, as their stock pattern, with the bayonet joint and not with the soldered connection. The difficulty of using them with the bayonet joint is that the contact between the socket and the lamp may not be a perfect one, and therefore, as Mr. Harrison properly pointed out, errors may be introduced. Mr. Harrison referred to the fact that we had given both the volts and the current that were used in that experiment. The object of giving both was to eliminate all sources of possibility of there being a bad connection. Mr. Harrison was quite right in saying that if you know the volts the current is also a definite quantity provided the connection is a perfect one; but by measuring carefully and accurately both the volts and the current you can tell if your connection is good; and therefore both the volts and the current were given to a high degree of accuracy, made higher than was necessary for the photometric purposes, in order that persons using the lamp might be able to check whether the connection was a good one, that is to say, whether the bayonet joint was satisfactory. If the bayonet joint was not satisfactory, then it meant merely a little cleaning or strengthening; it was easily put right.

1775. Your object was to neutralise any deficiency that might be caused by the bayonet joint?—Yes. Mr. Paterson, who did the work, was perfectly well aware of the difficulty; and Mr. Paterson has frequently been in communication with Faraday House over this very question. We have tested a number of lamps for Faraday House, and the whole difficulty of getting connection with a bayonet joint has been discussed frequently. Then we come to another point in Mr. Harrison's evidence, and that is the question of advertising. I should quite agree that there may be difficulties as to the use of the certificate of the Laboratory for advertising purposes. I do not think that it is really possible to avoid their use at times, and I should urge that, provided the certificates of the Laboratory were merely certified statements of results arrived at, and avoided as far as possible expressions of opinion, no harm but only good would come from their use for advertising purposes. I will deal in a moment with one or two questions that he raised. I should like, however, to read the section dealing with the question in the regulations for the Versuchsanstalt, on page 4 of my translation: "Since the support and furtherance of industrial efficiency must be the aim of a public institution, no objection can be raised to the proper use of its certificates for the advertisement of goods. The institution has the help of the law to prevent their improper use in trade rivalry, and on this account its certificates are made as definite as possible. They contain as far as practicable only the results and measurements, and avoid, whenever possible, general statements as to the properties of the goods." I have endeavoured to follow that practice with the certificates of the Laboratory. They are occasionally used, I know, for advertisement purposes, but I do not see that any harm has come from that. Mr. Harrison referred to one or two special cases. The first was an advertisement that was issued by the British Thomson-Houston Company, "A Lamp Guarantee," and he there called attention, as he said, to the fact that in the advertisement only a portion of the information that obviously had been afforded by our test was put forward, and he tried to suggest, I think, that that was a case in which the full scientific enquiry work that had been done by the Laboratory had not been published. We have never undertaken to publish, and I do not think the Report calls upon us to publish, the results of all simple straightforward tests of instruments and things of that kind. It is clear we cannot publish all these 20,000 or 30,000 clinical thermometer certificates, and a question may arise as to whether a certificate that a certain lamp has been compared with a standard and is found to be good or bad, should be published or not. It did not seem to me that it was one that need be published. It came under the same category, I thought, as an instrument. No piece of scientific knowledge would be withheld by the non-publication of this, because the whole question of the behaviour of lamps, and especially the behaviour of English lamps, had been made the subject of very careful study at the Laboratory by Mr. Paterson, the assistant in charge, and about the same time as this advertisement was issued a paper, of which I have a copy here, was read by him before the Institution of Electrical Engineers. That gave the full results of all the tests that had been made; I do not mean on these individual lamps, but on lamps of the same class. All the scientific knowledge that we have acquired with regard to lamps has been published, not only tests for ourselves but tests made for the Admiralty, and the War Office, and the Post Office, and a large number of other results. That paper is now looked upon as a standard document for information as to the behaviour of modern lamps, and in particular as to the behaviour of these standard lamps. Mr. Paterson, who has been responsible for all this testing work, is the author of this paper, and he has just been awarded the first premium from the Institution of Electrical Engineers for the best paper of the year, and that contains the whole of the scientific knowledge that we have acquired with regard to lamps. But if we turn to the complete advertisement of the British Thomson-Houston Company, the full details of both the British Thomson-Houston lamps and the "A" lamps are given. Here is a copy of the pamphlet, and you will find the curves are given for both the British Thomson-Houston lamps and the "A" lamps. (*Pamphlet handed in.*) So that the facts with regard to those lamps about which Mr. Harrison is complaining have been made public by the publication of that statement. That is not our pamphlet. As a matter of fact those lamps came to us for what was practically an arbitration case. They were not sent to us by the British Thomson-Houston or by the other Company. They were sent to us by the engineer of one of the large

municipal electrical undertakings, who said "We are sending you to-day three 16 c.p., three 25 c.p., and three 32 c.p."—certain lamps that are now called the "A" lamps—"with a view to ascertaining whether the 16 and 25 c.p. lamps have a useful life of——"—so many hours. Then they further said they were sending another instalment of other lamps in order that we might enquire whether those lamps had a useful life of some other number of hours, and we made the tests, and made the report to the engineer of the Company. It appears there had been some question as to these Companies fulfilling their guarantees to him, and they agreed to refer the matter as to whether the lamps came up to the guarantee or not to us. The British Thomson-Houston lamps, I know from our report, did come up to the guarantee.

1776. (*Mr. Crossley.*) May I ask whether anybody knows what "A" lamp means?—I know it. I have it here.

1777. It was not published?—No, it was merely a name to indicate the lamp of a certain maker. Mr. Harrison also raised some objections with regard to some tests made for the Premier Accumulator Company which he said had been made use of in a prospectus. I was not aware of that fact, but that series of tests was made by us at the request of Sir William Preece. Sir William Preece referred in his evidence to the important work that had been done at the Laboratory with regard to certain accumulators, and he authorises me to say that these Premier Accumulator cells that Mr. Harrison has referred to were the cells to which he referred. The work came to us with an introduction from Sir William Preece, asking us to undertake the tests that were proposed to us by a gentleman whom he introduced, and that work went through as a piece of ordinary test work that we could fairly and properly do.

The general question of lamp testing was raised also by Sir William Preece and by various others, and I think reference was made to the work of the Engineering Standards Committee and to the specification for carbon lamps which they have issued. Here is a copy of the specification, which shows the result of the work of a Sub-Committee, of which I was Chairman. The researches and investigations that led up to it formed part of this paper of Mr. Paterson. It was shown amongst other things in the course of that work that of 10 sets of lamps that were bought at random, and which had a supposed useful life of 400 to 450 hours, the actual useful life found varied from 150 hours to 500 hours. With a view to avoiding difficulties of that kind in future, this specification was prepared after conferences with the lamp makers and with lamp users and electrical engineers all over the country; they were all brought into agreement, and now the lamp makers, all the best ones at any rate, are prepared to make lamps to this specification. But at present the specification is a dead letter, and will practically continue to be a dead letter, because there is no recognised institution which is authorised to say, by tests of specimens of these lamps, whether they come up to the specification or not. The engineers are anxious that that work should be done; the makers are anxious that the work should be done; they have approached me several times, and, as has been said in the evidence that has been given before the Committee, they are quite willing to accept the National Physical Laboratory as the authority to settle whether they are working to the specification or not, when questions arise. That matter has been going on for some time, and the new Photometric Department at the Laboratory has been put up and organised to some extent with the idea that that work would form part of the work of the Laboratory in future. But for the present it is all hung up, because it is urged, as you are aware, that that is commercial testing, and that the Laboratory ought not to undertake commercial testing, and the Engineering Standards Committee are waiting, I understand, for a decision from this Committee.

1778. (*Chairman.*) Do you regard the testing of lamps as the testing of materials or the testing of instruments?—I think it is the testing of instruments, but it is perhaps a question. It might be held to be a testing of materials, because you do not test each individual instrument. You try to test, by a selection from the batch of lamps, the uniformity of the material of which the filaments and lamps are made, and by means of some tests which are described in this specification, on a comparatively small percentage of the lamps, it is possible to find out if the lamps have been properly manufactured and if your specimen sets taken at random by yourself are proved to be properly manufactured, the probability is that the rest of the batch made at the same time are also properly manufactured.

1779. I understand there are some technical difficulties rendering it necessary that there should be a recognised authority?—Yes. The question is before the Board of Trade whether the Laboratory can act under the Trade Marks Act, and act as an authority in this way.

1780. (*Mr. Chalmers.*) Your own feeling is that it is rather like the standardising of instruments?—I think it may be looked upon as the standardising of instruments.

1781. (*Chairman.*) If you were to undertake this work would it not actually interfere with the business of private firms?—I do not think so. I do not think it would interfere at all seriously. Faraday House does a certain amount of this lamp testing, and there is also the Westminster Testing House. I do not think there is anywhere else where it is done. But I do not think it would interfere at all with what they do; it would sometimes be additional, because the guarantee of a private establishment would not, I fancy, be accepted by the makers as a sufficient and satisfactory guarantee under the terms of this specification. They want an authorised institution to give the guarantee. I should doubt also whether either of those institutions are prepared to deal with the question on the large scale on which it would have to be dealt with if it were assigned to the Laboratory. Of course the number of electric lamps that are made to specification is many millions.

1782. (*Mr. Crossley.*) Do you propose that this should be brought before the Board of Trade?—I do not think it is necessary to do that, provided the mark of the Laboratory is recognised by the Board of Trade. But the work of the Engineering Standards Committee is in very close connection with the Board of Trade throughout, and what the arrangements between Sir John Wolfe-Barry, who is the Chairman of the Engineering Standards Committee, and the Board of Trade will be I do not know.

1783. (*Mr. Chalmers.*) Would you like to put your mark on a hundred things if you have only tested five?—In this way I would. It might be a different mark from the one put on the other instruments—thermometers for instance, and would bear a different meaning.

1784. You certify every thermometer as such?—Yes. we issue a different certificate with each thermometer. In the case of lamps the mark would mean they were part of a certain number, the proper percentage of which had been tested as described in the specification.

1785. (*Mr. Crossley.*) You could not test every lamp, because you would destroy it?—Yes, you could not test every lamp. May I turn now to one or two general points? As to the government of the Laboratory, I think the Committee are well aware of how the Laboratory is governed. Sir William Ramsay made a suggestion that there should be special Committees to advise. May I say that they exist already, and have existed from the beginning. One of the first pieces of work that was done was to appoint Special Committees on Terrestrial Magnetism, Mechanics, Chemistry, Thermometry, Electricity, Metrology and Meteorology. In addition to these are the Alloys Research Committee of the Institution of Mechanical Engineers and the Electrical Standards Committee of the British Association; and various Sub-Committees of the Engineering Standards Committee are in close touch with our work and take an active part in directing it.

1786. (*Chairman.*) Were those Special Committees all formed of members of the Executive Committee?—No; there were comparatively few members of the Executive Committee upon them.

1787. They were drawn from outside?—Yes. With regard to the actual formation of the General Board and the Executive Committee, the Executive Committee is surely as representative of Industry, in general, as it can be made. The members are nominated, some by the Royal Society, some by the Institution of Civil Engineers, Mechanical Engineers, Electrical Engineers, the Iron and Steel Institute, and the Society of Chemical Industry.

1788. (*Mr. Chalmers.*) Is not the Royal Society rather fully represented on the Executive Committee?—The Royal Society might, if it restricted itself to nominating Fellows of the Royal Society, be said to be over-represented, or too fully represented. But, I think, if you look through the list of the nominees of the Royal Society, you will find it has always named a considerable

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number of gentlemen who are not Fellows of the Royal Society, but who are generally interested in industry.

1789. It puts on the whole of its officers, practically, does it not?—Not on the Executive Committee.

1790. Is not the Treasurer a member of it?—The Treasurer, and one of the Secretaries.

1791. The President?—Lord Rayleigh has been Chairman of the Executive Committee from the beginning.

1792. Is he on as a Fellow of the Royal Society or as Lord Rayleigh?—He is on as Lord Rayleigh.

1793. (*Chairman.*) Did you say these Special Committees were appointed by the Executive Committee —They were appointed by the Executive Committee. This is the Minute: "At a meeting of the Executive Committee of the National Physical Laboratory, held on July 31st, 1899, it was resolved: 'That the following be appointed members of the several Sub-Committees. Resolved: That Sub-Committees be appointed for the purpose of drawing up a series of suggestions as to the work which might be usefully carried out in connection with the following branches of science,'" and then follows a list of names. That was the action taken by the Executive Committee of the National Physical Laboratory at one of its earlier meetings.

1794. The chairmen of the various committees were all members of the Executive Committee, I presume?—I should think probably so. I really am not sure on that point, but I see from the lists that Sir Andrew Noble was. Professor Ayrton has never been on the Executive Committee; he was chairman of the Electricity Committee. General Strachey, I think, was on the Executive Committee. All except Professor Ayrton were members of the Executive Committee at the time.

1795. Are these committees kept up to date? If any members resign are they replaced by others?—They have not met very frequently as committees. What has happened has been that there has been a meeting of the general Board annually, of which many of these gentlemen are members, and I have felt myself at liberty to go to these committees, or to individual members of these committees, for advice, and for discussion of various points of interest as they arose.

1796. The committees have not met regularly?—They have not met regularly. There would be no difficulty, I think, if it was thought desirable, in arranging that they had specified dates of meeting, or that they were called together more formally and more definitely than has been done.

1797. If there was to be a meeting of a committee, who would summon it? The Chairman?—Whenever a meeting has been necessary, I have communicated with the Chairman and asked for a meeting. I think the Committee have had put before them, by Mr. Maw and by various other witnesses, the difficulty of framing quite definite and special resolutions as to what the Executive Committee may do and what they may not do. What I think the Executive Committee has always aimed at doing has been to carry out the work of the Laboratory in the spirit, at any rate, of this report, for the general advantages of industry and as far as possible without interfering with existing agencies of any kind. I do not know what the feeling of this Committee may be, but it appeared to me on reading through the evidence that there was very little, if anything, that had been done that could be said to have hurt private practitioners up to the present, and I am quite confident there is no intention on the part of the Executive Committee to do anything, if they go on in the future, that would hurt private practitioners. Perhaps I may be allowed to refer, in conclusion, to one or two financial questions.

1798. Before we pass from that subject I would like you to enlarge a little more upon the difficulties which would be encountered in framing special regulations. Do those difficulties arise specially from the difficulty of drawing hard and fast lines?—Chiefly.

1799. For instance, would there be a difficulty in distinguishing between commercial testing of samples and testing which partakes more of the nature of research?—I have not yet heard of any very exact definition given by any of the witnesses of what is meant by commercial testing of samples.

1800. (*Mr. Chalmers.*) To specification?—You mean the ordinary breaking tests and bending tests of iron and steel bars to specification?

1801. Whatever the specification may be; in a contract, to see that the material comes up to the terms of the specification?—And is that to include existing tests, or these novel tests that we are introducing every day?

1802. Take a breaking test for instance, to see whether a material will stand a certain strain. Is that not a simple thing?—Yes. If you say in so many words that it is not desirable for the Laboratory to undertake the ordinary straightforward breaking tests of materials, except under special conditions, as part of a research or as a reference or something of that kind, I do not think there would be any difficulty in carrying out that rule. But if you say the Laboratory must not undertake commercial tests of materials, that appears to me to be very much too wide. I should wish on this point to refer to the evidence given on the first day, in particular to Answers 147-152.

1803. But if it is to see whether a certain sample of material does or does not come up to the specified conditions set out in the contract, that is simple enough, is it not, as a definition?—But suppose it happens, as might quite well happen now, that the specific conditions in the contract include and refer mainly to some tests that we have devised and arranged?

1804. (*Chairman.*) Some tests, you mean, that are not carried out elsewhere at the present time?—That are not carried out elsewhere at the present time, but may be carried out elsewhere if they become common.

1805. (*Mr. Chalmers.*) Everybody, I think, would agree it would be your function to be the pioneer of tests, and, so far as you could, introduce a new test useful to the commercial community, that would be a boon you would have conferred upon them?—Yes, but how is the case to be met by regulation?

1806. That is a different thing from being a little more in the ordinary rut?—I am looking forward to the future. If there is to be a statement that the ordinary straightforward breaking test is only to be done under special circumstances, that is one thing; but if you say that we are not to undertake tests to see if material comes up to specification, and if it happens in the course of a year or two years that the very tests mentioned in the specification are the tests that have been devised or introduced by the work of the Laboratory, are we then bound not to undertake those tests? That is the difficulty I see in drawing up specific regulations. Another difficulty occurs in the case, which is quite frequent, of testing an instrument to specification, and the specification containing a clause that the material of which the instrument is made is to satisfy certain tests.

1807. (*Chairman.*) Supposing you had done pioneer work in connection with a certain kind of testing, the moment that test has been established and is universally asked for is the Laboratory to cease to do that test and leave the field open to private enterprise alone?—That is a further difficulty. At present everything of that kind that we do we try to publish, and it is quite open to all the others. Various gentlemen who do commercial testing work come down and see the Laboratory. Mr. Kirkaldy spent some time with us some few days ago; we try to assist him as far as we can, and the new methods of testing that we have devised are perfectly open to him if he thinks it worth while to adopt them. But I should maintain, I think, that they ought also to be open to us to use.

1808. You would at all events not be, in a case of that kind, entering a field already occupied by private enterprise, so far as those new tests were concerned?—No.

1809. Would you develop what you were saying a little further?—I should say, with regard to what I believe are now generally understood as commercial tests—that is to say, strength tests, breaking tests, bending tests, and so on, as at present practised in professional testing establishments on materials of construction—that except in the case of reference work and Government work, or in connection with complete investigations, there is no need for the Laboratory to undertake them. I do not think the Executive Committee would wish to undertake them, if it were pointed out that this Committee thought it was best they should not. But I should say that there would be very great difficulty for this Committee to find a form of words which would preclude that work and would not preclude in the future work that it would be agreed the Laboratory ought to do and might do. For instance,

suppose that it is said that commercial testing of materials* is forbidden.

1810. (*Mr. Chalmers.*) To specification?—To specification. What are you to say with regard to the lamp?

1811. I thought you regarded that rather as an instrument?—I do not know that everybody else would, and similar cases are very numerous.

1812. But generally speaking I gather from your last answer you would be prepared to follow the spirit of the thing, though you think it would be difficult to give an exact definition in all cases?—I am entirely prepared, and I am sure the Executive Committee are entirely prepared to follow this Committee. The Executive Committee have declared in various ways that they have no wish to injure in any way existing practitioners, that they rather wish to help them as far as they can.

1813. And if they can devise at the Laboratory new tests that is their desire, and their desire is to make those tests as public as possible for outside people?—Yes.

1814. And not to confine people outside to existing tests?—That is quite so. The Committee saw some of Dr. Stanton's testing machines a few days ago. One of the most important firms of instrument makers are now in communication with us, and their representatives have visited the Laboratory several times to get drawings of those machines and they propose to put those machines on the market. Of course we have no objection, we merely ask that, in advertising the machines or selling the machines, it should be mentioned that they are taken from the machines of the Laboratory.

1815. (*Mr. Crossley.*) Do they pay nothing for this?—No.

1816. I think that is taking a very unfair advantage?—Everyone has the advantage. That is one of the great benefits we can confer on Industry. The following is another instance of this. Dr. Stanton devised and described in public an apparatus for the accurate measurement of high pressures. Messrs. Schaffer and Budenberg, very large makers of pressure gauges, both in England and Germany, have as a result, I am told, scrapped all their high pressure testing appliances and adopted, with some modifications, Dr. Stanton's device. As an acknowledgment they have just presented us with a very beautiful piece of testing apparatus employing this principle.

1817. (*Chairman.*) Would you be prepared, in proportion as tests, once new, became habitual, to withdraw from the field and leave it entirely to private enterprise as regards those tests? It is in cases of that sort that special difficulty appears to me to arise?—Is that not looking forward a long way?

1818. (*Mr. Chalmers.*) At any rate, you would have found your title to public recognition by devising the new tests?—Certainly. I think I should be prepared to comply with the spirit of that last question of the Chairman's, though I do not know in every case how it would work. It really is, in great measure, a financial question.

1819. (*Chairman.*) Let us come to finance. You wanted to say something on that subject?—Merely that this testing work has been a source of income to the Laboratory, and is likely, if it continues, to be a source of income, and if the research work of the Laboratory is to go on on the kind of scale I hope it will go on, it is necessary that the income should be kept up to something like its present amount. During the past year we have lost, through the two special cases that I have referred to, perhaps £400 or £500, or perhaps £1,000.

1820. Those would clearly not fall under commercial testing?—No, those failed because of the publication clause.

1821. (*Mr. Chalmers.*) How much real profit do you have out of the work of commercial testing? The gross receipts, of course, are not the measure of the profit?—No, certainly not.

1822. I think you spoke of 15 per cent. added on to the actual cost of material and labour?—That is what I have been charging for test work.

1823. That would have to include and cover establishment charges of all kinds, including rent and so forth?—We have no rent, of course. Perhaps you may argue that we ought to pay ourselves a rent.

1824. My point is a very simple one, that the work you do does not bring you in very much net?—No, I do not think it does directly. It brings us in a good deal, though, in this way. We need most of the apparatus that is used for testing purposes for our research work. It is practically all of it used from time to time pretty continuously and thoroughly for research work. If the profit on the tests merely recoups us in time for the cost of the apparatus, it is all to the good.

1825. I think you said, however, that in considering what charge you would make for apparatus in a given case you took into account whether it would be any use to you yourselves subsequently?—In some cases, yes.

1826. And you, therefore, reduce the charge to the client?—We might do that in some cases.

1827. Consequently your proportion of profit is reduced further still?—Yes.

1828. You cannot count it twice over?—No; I do not think I was going to attempt to count it twice over at all. If we may take the case of the testing machine, time after time a criticism has been made on our research work, "Oh, that is only done with a 10-ton machine." In order to make that of the value it ought to be, it ought to be done on a much larger scale. The fact that the Indian Government have put the Cooper's Hill testing machine, a 100-ton machine, at our disposal increases the value of all that kind of research work to an enormous extent, and we ought to take that into account in considering the cost and the fees we receive for test work.

1829. (*Chairman.*) Complaint has been made by several witnesses of the priced pamphlets which you issued. Do you attach much importance to the issuing of those pamphlets in their present form?—I do not know, in their present form. I think it is most desirable to have a priced pamphlet and to issue it to applicants, because it enables them to see what we can do at the Laboratory, what the conditions of test are, and it simplifies, to such an enormous extent, the correspondence work, and all that kind of thing.

1830. Evidence has been given, on behalf of the testing establishments, that they would consider the issue of priced pamphlets as unprofessional?—Yes. The priced pamphlets were issued by the Kew Observatory long before there was any question of this nature. They are very old. I gave at the first meeting the date of the first pamphlet.

1831. (*Mr. Chalmers.*) That really means, does it not, the charge for standardising a thermometer or a watch. That is really all it is?—Yes, or other things of that kind.

1832. (*Mr. Crossley.*) Are not they issued by the Germans?—They are, this is quoted from the German Versuchsanstalt regulations, and the same applies to the Reichsanstalt. "To aid persons in using the Institution a complete table of charges will be prepared. Separate sections of this will relate to the different kinds of tests as these develop themselves in the course of time. The statement of fees affords also a *resumé* of the help the Institution can offer, so that information can be obtained as to what extent and in what manner its assistance can be expected in special cases."

1833. (*Chairman.*) If you were prepared, as a general rule, to refuse ordinary commercial testing work, is it desirable to quote prices in your pamphlets for such work?—I think that if there are to be certain tests, such as the breaking tests that have been referred to, which we should generally refuse, it would be desirable to erase price reference in the pamphlet. But there again, it is very difficult to know what is meant by ordinary commercial tests. I have said that there would be no difficulty about not taking ordinary breaking tests. May I give an illustration of what happened a month ago? Messrs. Vickers, Maxim & Co. wrote to us and said: "Will you make for us breaking tests on five specimens of nickel steel, different proportions of nickel, at temperatures of 15 degrees, the ordinary temperature, 100, 200, 300 and 500 Centigrade?" Of course we did that. I am not quite clear whether, under the kind of rule that you are speaking of, it would be ruled out or not, but I know there was no other place in the country, and probably no other place in the world, where it could be done.

1834. (*Mr. Chalmers.*) That would not be of the nature of a test to carry out a contract to specification?—I

* *Vide* the distinction made between the ordinary commercial testing of materials and the testing of materials in the wider sense in which it was used in Answers 9–37 and in the Table put in in reply to Question 38. (Appendix I., VII.)

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suppose they wanted to know if they could use the steel in a motor car, or for something of that sort.

1835. (*Chairman.*) It might be to a specification?—It might be to a specification, most certainly,

1836. There certainly would seem to be great absurdity in debarring you from carrying out experiments that nobody else could carry out?—I think I could find many cases—I do not know that I can give actual examples straight away—in which difficulties of that sort do come up. The Committee had some evidence from a gentleman representing the Iron and Steel Institute, I think Mr. Bagley, who is an iron manufacturer. This came to me a few days ago from Mr. Darby, the Managing Director of the Brymbo Steel Works: "Dear Sirs, Will you be good enough to send a copy of your Report for 1906. I sincerely hope that the various branches for testing, even including chemical analyses, will be continued by the Physical Laboratory. I look upon it as of the very greatest importance that a Laboratory of this kind should be available for independent testing purposes of all kinds. I do not see why it should be objected to, and I hope that rather than abandon any branch of the work it now undertakes, the scale of charges will be raised so as not to compete with local analysts." I wrote to him and asked if I might mention that to the Committee, and he wrote back: "In reply to yours of the 24th instant, you may certainly use any letter I have written. We consider that the work undertaken by the National Physical Laboratory is most useful, and it fills a long felt want. The question of fees is not so much a consideration, as to have a place where an independent reference can be obtained."

1837. (*Mr. Chalmers.*) Reference. That is where there is a difference of opinion?—Yes. "As outsiders, we trust that the scope of the National Physical Laboratory will not be curtailed." That is evidence of another director of a very large ironworks.

1838. Yes, referring to a long felt want, and for the purpose of reference?—Certainly.

1839. (*Chairman.*) Is there anything else which you would like to put before us?—I think I have nothing else.

1840. (*Mr. Crossley.*) Does the National Physical Laboratory, as the Reichsanstalt does, give advice?—We give advice on the spot. We have made a practice of not going out to give advice, though we have been asked to do that. But we certainly give a very considerable amount of advice daily. Enquiries come to us as to what is the behaviour of this material, what are the conditions under which something else will happen, and so on. This morning, for instance, I had a letter to this effect; "We have been requested to make hydrometers for a certain purpose; will you give us a table of specific gravities adapted for this purpose," for certain rather out-of-the-way oils which they mentioned.

1841. Do you charge for doing that, or is it given free?—It would depend upon where the request came from. Probably it would go free, because probably it would come from a firm which was in the habit of sending instruments for test, and with a sort of understanding that the instruments when made would come to us to be tested, and it would be charged for in that way. I said just now that I had nothing further to say, but I should like, if I might, just to refer to the arrangements with the Admiralty, though of course being Government work it is somewhat exceptional. We do a very large amount of work for the Admiralty, especially in the testing of telescopes, and of late years a very large work has been done with regard to the testing of telescopic gun-sights. Some few years ago they wanted a special arrangement of gun-sight, a special device whereby it could be used at a low power so as to give a wide field, and also at a high power so as to give great magnification when they had got the gun nearly directed. Various firms were asked to suggest instruments for this, and these were sent down to us to report upon. I had to report that none of the instruments sent were completely satisfactory, and that as the arrangements were, in certain respects the best of them would certainly get out of order in use and would fail. But I said I thought I could alter that in my own workshop; and I got authority to take one of these sights to pieces, to reconstruct it in certain ways, and to send it out with a drawing and specification to the Admiralty. That was accepted, and practically every gun-sight that has been made since has been made to that specification. We did a certain piece of work for the Admiralty, and we do just the same kind of work for private firms.

1842. (*Mr. Chalmers.*) Am I not right in thinking that in Germany the formation of the Versuchsanstalt and so forth met a want as regards testing of materials which was not so fully felt in this country, where we had already at work people like Kirkaldy and Stead?—Yes, so far as I am aware, that is so.

APPENDICES.

APPENDIX I.

STATISTICS relative to the Growth and Work of the National Physical Laboratory, 1901–1906.

I.—STAFF OF THE LABORATORY.

Director—R. T. GLAZEBROOK, M.A., D.Sc., F.R.S.

PHYSICS DEPARTMENT.—ASSISTANTS.

J. A. HARKER:

Owens Coll., Manchester. John Benjamin Smith Exhibitioner, 1886. Dalton Chemical Scholar, 1890. Hon. Fellow, 1890. Research at Tübingen, 1890–1 and D.Sc. Returned to Owens Coll. Bishop Berkeley Fellow in Physics, 1896. M.Sc.Manchester. Became Research Assistant at Kew, 1896. Worked for the Kew Committee at the Bureau International, 1896–7. Returned to Kew, and in 1900 was appointed on the Staff at Bushy House. Joule Student of the R.S., 1903–4. Member of Council of the Physical Society.

Senior Assistant in the Physics Department and Head of the Thermometric Division.

A. CAMPBELL:

Edinburgh Univ., 1882–3. Scholar of Corpus Christi Coll. Camb., 1884–7. 1st Sen. O., 1886; 2nd Class, 2nd Part Nat. Sci. Tripos, 1887. B.A.Camb. Assistant Master for Physics and Chemistry at Clifton Coll. Worked at Electrotechnics in Central Technical Coll., 1890–1. Superintendent of the Testing Department, Faraday House, 1893–1901. Member of Council of the Physical Society, Associate Member of Council of the Institution of Electrical Engineers.

Assistant in charge of Electrical Division I. of the Physics Department since 1901.

W. HUGO:

Observer at Greenwich Observatory, 1876–85. Assistant at Kew, 1885–1901: then transferred to Bushy House.

Assistant in Thermometric Division.

F. J. SELBY:

Rothschild Exhibitioner, Univ. Coll., London, 1888; B.A.Lond. Scholar Trinity Coll., Camb. 6th Wrangler, 1891. M.A.Camb. Senior Mathematical Master, Bristol Grammar School, 1892–1901.

Assistant, in charge of Tide-prediction and Optical Division of Physics Department.

C. C. PATERSON:

A.M.I.C.E., A.M.I.E.E. Studied at City and Guilds Institute, Finsbury, 1897. Apprenticed to Geo. Wailes and Co., 1898–1901. Fitter at the Mirlees Watson Co., Glasgow, 1901. Test Room Assistant, Faraday House, 1902. Assistant Electrical Engineer to the Maschinen-Fabrik Oerlikon on the Jungfrau Railway and in Italy, 1902–3. Premium Elec. Engnrs., 1902, and First Premium, 1907.

Assistant in charge of the Electrotechnical Department.

F. E. SMITH:

National Scholar, Royal Coll. of Science, 1896–9. Senior Associate, 1899. Assistant to Sir A. W. Rücker, 1899–1901. Teaching Associate in Physics of the Royal Coll. of Science, 1901. Lecturer in Physics, Regent Street Polytechnic.

Assistant in charge of the Electrical Standards Division of the Physics Department.

H. H. JEFFCOTT:

Trinity Coll., Dublin, 1895–1902. B.A., 1899; B.A.I., 1902. 1st Scholarship Mathematics, 1898. Moderatorship in Mathematics, 1899. Senior Moderatorship in Experimental Science, 1899. McCallagh Prize for Mathematics, 1901. 1st Class Hons. Engineering, 1902. Assistant Engineer in the Technical Department at Siemens Bros., Woolwich and Stafford. 1902–4.

Assistant in charge of the Metrological Division of the Physics Department.

S. W. MELSOM:

Finsbury Technical Coll., 1896–7. Chelsea Polytechnic, 1897–8. With Messrs. Crompton & Co., 1895–1900 (1900–1 served in South Africa). With Kensington and Notting Hill Electric Light Co., 1902.

Assistant in charge of direct current measurements in the Electrotechnical Department.

E. H. RAYNER:

Exhibitioner Trinity Coll., Camb., 1894–8. M.A.Camb., A.M.I.C.E., A.M.I.E.E. 2nd Class, 1st Part Nat. Sci. Tripos, 1896. 1st Class, 2nd Part Nat. Sci. Tripos, 1898. With Willans & Robinson, Rugby, 1899–1901. With Heenan & Froude, Structural Engineers, Manchester, 1902. 1st Premium, Elect. Engnrs., 1905.

Assistant in the Electrotechnical Department.

J. DE GRAFF HUNTER:

Senior Scholar, Pembroke Coll., Camb., 1900–1904. M.A.Camb. 12th Wrangler, 1903. 1st Class, Engineering Tripos, 1904. Secretary to Lord Kelvin, 1904–5.

Assistant in the Tide Prediction and Optical Departments.

S. W. ATTWELL:

Wilts. County Scholar at Finsbury Coll., 1895–6. With Easton, Anderson & Goulden, General and Electrical Engineers, Erith, 1896–9. Assistant in Inspection Department, Vickers, Son & Maxim, Barrow-in-Furness.

Junior Assistant in Metrological Department.

A. BLACKIE:

Scholar of Peterhouse, Camb., 1900–4. 1st Class Nat. Sci. Tripos, 1903. Wiltshire Prize, 1903. 3rd Class Mech. Sci. Tripos, 1905. Junior Demonstrator and Research work, Engineering Lab., 1906. Assistant Master at Dartmouth Coll., 1906–7.

Junior Assistant in Thermometric Division of the Physics Department.

ENGINEERING DEPARTMENT.

T. E. STANTON:

Owens Coll., 1888–91. 1st Class Hons. Engineering, B.Sc., 1891. Junior Demonstrator in Whitworth Laboratory, 1891–4, M.Sc., 1894. Senior Demonstrator, 1894–6. Lecturer in Engineering, University Coll., Liverpool, 1896–9. D.Sc.Manchester, 1899. Professor of Engineering, University Coll., Bristol, 1899–1901.

Superintendent of Engineering Department since 1901.

C. JAKEMAN:

With Messrs. Merryweather, 1890–1. University Coll., London, 1891–4. Senior Gilchrist Scholarship, 1892. Demonstrator in Engineering and Assistant to Professor Hudson Beare, 1894–1901.

Assistant in Engineering Department.

L. BAIRSTOW:

National Scholar in Mechanics, Royal Coll. of Science, 1898–1901. Assoc. Royal Coll. of Science, 1901. 1st in Mechanics. Whitworth Research Scholar, Royal Coll. of Science, 1901–3.

Assistant in Engineering Department.

DEPARTMENT OF METALLURGY AND METALLURGICAL CHEMISTRY.

W. ROSENHAIN:

Kernot Research Scholarship in Physics, Argus Scholarship in Engineering; B.C.E., Melbourne. 1851 Exhibition Scholar, 1897–1900; B.A. Research, Camb. Telford Premium, Inst. of C.E. Associated with Professor Ewing in the Bakerian Lecture, 1899. Scientific Adviser and Chief Chemist in Chanbe Bros. Glass and Lighthouse Works, 1900–6. Carnegie Medallist, Iron and Steel Institute, 1906. Member of Metallurgical Nomenclature Committee, 1900–1. President of Optical Society, 1906–7.

Superintendent of the Metallurgical Department, 1906.

F. C. A. H. LANTSBERRY:

Corporation Scholar, Manchester Technical School, 1899–1902. Diploma of Associateship, 1902. Demonstrator, Research work, 1902–3. Chief Assistant Chemist, British Westinghouse Co., 1903–6.

Junior Assistant for Alloys Research in the Metallurgical Department.

J. MURDOCH:

Yorkshire Coll., Leeds, 1878–81. Certificate in Advanced Chemical Theory and Analysis. Twenty years in Steel Works as Metallurgical Chemist. Junior and Senior Assistant at Cooper's Hill and afterwards Senior Assistant to Mr. Harbord.

Assistant in the Department of Metallurgical Chemistry.

W. GEMMELL:

Glasgow Technical Coll., 1901–5. Assistant to Messrs. Tatlock & Thomson, City Analysts, Glasgow, 1901–4. Assistant to Senior Chemist, Glasgow Corporation Gas Trust, 1904–5.

Junior Assistant in the Department of Metallurgical Chemistry.

S. L. ARCHBUTT:

Technical Coll., Derby, 1899–1900. University Coll., Nottingham, 1900–5. Assistant in Midland Railway Chemical Laboratory, Derby, 1906–7.

Junior Assistant in the Department of Metallurgical Chemistry.

FORMER ASSISTANTS.

H. C. H. CARPENTER:

M.A.Oxon. 1st Class Final Hons., School in Chemistry, 1896. Leipzig, 1896–8, Ph.D. Research Fellow, Owens Coll., 1898. Demonstrator, Owens Coll., 1899–1901.

Formerly Assistant in charge of the Metallurgical Division of the Physics Department, now Professor of Metallurgy in the Victoria University.

B. F. E. KEELING:

M.A.Camb. 1st Class Engineering Tripos. Scholar of Trinity Coll.

Formerly Assistant in charge of the Metrological Department, now an Officer in the Egyptian Survey Department.

W. A. CASPARI:

University Coll., Liverpool, 1893–7. B.Sc.(Hons.) Victoria University. Jena and Göttingen, 1897–9. Ph.D. Fellow of the Institute of Chemistry. Chemist at Messrs. Rowntree & Co.'s Works, 1899–1902.

Formerly Assistant in the Chemical Division of the Physics Department.

Accountant and Clerical Staff	5
Fitters, Engineers, Porters, Laboratory Boys, &c.	28

II.—RESEARCHES NOW IN PROGRESS.

Engineering Department.

Wind Pressure Experiments.
Impact Testing.
Range of Elastic Limits in Iron and Steel.
Specific Heat of Superheated Steam.

Physics Department.

Radiation Methods of High Temperature Measurement.
Electrolytic Conductivity of Solids.
The Properties of Metals at High Temperatures.
Accurate Resistance Thermometry, differential methods, &c.
Methods of Calorimetry.
New Metals and Alloys for use as Thermo-couples.
Magnetic Hysteresis in Iron.
Construction of New Type of Mutual Inductance Standard.
Construction of 50 metre Comparator for the Testing of Survey Tapes.
Ampère Balance.
Silver Voltameter.
Standard Cadmium and Clark Cells.
On the Properties of Manganin and other Resistance Alloys.
On a Standard Pattern of Resistance Coil.
High Tension Insulation.
Methods of Determining Speed and Efficiency of Photographic Shutters.
Investigation as to Methods of Testing Photographic Lenses.
Investigation as to Methods of Testing Oculists' Trial Cases.
Investigation of different Photometric methods.
Investigation as to methods of Life Test of Glow Lamps.

Metallurgical Department.

Further Research on the Constitution of the Copper-Aluminium Alloys. Mechanical Tests at High Temperatures on the Copper-Aluminium Alloys. Open-Sea Corrosion Tests on same (with the co-operation of the Admiralty).
Preliminary Work for Research on the Physical Structure of Eutectic Alloys.
Investigation of the Differential Method of observing Recalescence Phenomena.
Preparation of Alloys and Casts of Screw Threads for measurement purposes and optical means for examining the same.

III.—SPECIAL INVESTIGATIONS.

The following is a list of the more important Special Investigations undertaken by the Laboratory in connection with Public Institutions or at the request of private firms or individuals:—

1901.

Investigation as to the Standardization of Vessels for use in Milk-testing Apparatus.—*For the Board of Agriculture.*

1902.

Standard Leading Screws.—*For the War Office.*
Testing of Instruments for the National Antarctic Expedition.
Tests on Papers.—*For the Ordnance Survey Office.*
Series of Tests on the Properties of a New Steel.—*For Mr. T. B. Behr.*
Pressure Tests on Deep Sea Thermometers.
Examination into the hardness of various specimens of Type Metal.
Observations with Pendulums for the Geodetic Survey of India.
Examination into the properties of Thermometer Glasses.—*In conjunction with Messrs. Powell & Sons.*
Experiments with a view to Tests on Water Meters.

1903.

Specific Heat of Superheated Steam.—*For the Manchester Steam Users' Association.*
Research into the properties of Gutta Percha and Balata.—*For the India Rubber Co., Silvertown.*
Testing of Long Tapes for Survey Work.
Tests on Timber.—*For the Tasmanian Timber Corporation.*
Investigation into the Effect of Rise of Temperature on Insulating Materials used in Electrical Machines.—*For the Engineering Standards Committee.*
Arrangements for Testing Air Meters.
Tests on Steam Pipe Coverings.
Examination of Sound and Faulty Bronze Castings with a view to determining cause of failure.—*For Messrs. J. & E. Hall.*
Investigation of various samples of Solder, with a view to determining the cause of faulty action in certain cases.—*Undertaken at the request of a Workman in Birmingham.*

1904.

Research into the properties of Nickel-Steel Alloys.—*For the Alloys Research Committee of the Institution of Mechanical Engineers.*
Tests on Variable Power Telescopes.—*For the Admiralty.*
Vibration Tests on Steam-pressure Gauges.—*For the Manchester Steam Users' Association.*
Standard Scale of High Accuracy.—*For the Monotype Co.*
Temperature Distribution in Field Coils of Electrical Machines.—*For the Engineering Standards Committee.*
Comparison of Thermojunctions of Platinum and various Platinum Alloys, with co-operation of Mr. Geo. Matthey, F.R.S.
Series of Tests on Incandescent Gas Mantles.—*For the Office of Works.*
Examination of Standard Rail Templates.—*For the Engineering Standards Committee.*
Effect of Atmospheric Pressure on Watch Rates.

Examination of large series of Electric Lamps of various patterns: comparison of over-running and ordinary life test.—*For the Admiralty.*

Inquiry as to the possible causes of fracture of Four Boiler Plates during welding under a steam hammer.

Investigation as to cause of fracture of an Unused Steel Rail which broke during unloading on to Railway Track.

Microscopic Examination of a Strip Sheared from a Brittle Butt Strap Plate.

Examination of Boiler-plate which had failed under Hydraulic Test.

Action of certain Fuses.—*For the British Electric Calibrated Fuse Co.*

Verification of Set of Native Weights and Measures.—*For the Nizam of Hyderabad.*

Chemical, Electrical and Microscopical Tests of Insulating Material and Paper.—*For the County of London Electric Supply Co.*

Candle-power of Special Incandescent Mantle and Cylinder.—*For Mr. F. Cox.*

Determination of Percentage of Ash in Samples of Fuel.—*For Messrs. Christy Bros. & Middleton.*

Determination of Melting Points of a series of 16 Alloys.—*For Messrs. J. J. Griffin & Sons.*

Microscopic and Electrical Tests of Ferranti Concentric Cable.—*For Sir W. H. Preece.*

1905.

Tests on Gas Cylinders.—*For the Agenoria Co.*

Investigations undertaken for the *Engineering Standards Committee* :—

(1) Investigation as to permissible tolerance in running fits. Report on various specimens of work submitted by manufacturers.
(2) Examination of Bolts and Nuts for Screw-Threads Sub-Committee.
(3) Investigation into the Internal Temperatures of Transformers.
(4) Examination of Standard Pipe Flange Templates.

Inquiry into Cause of Explosion on s.s. Orizaba, due to Corrosion of Copper Steam Pipe.—*For the Marine Department of the Board of Trade.*

Comparison of different kinds of Glass for Chemical Apparatus.

Examination into relation between various Standards of Light.—*For the Institution of Gas Engineers.*

Tests on the Inductive Capacity of various samples of Paper.—*For the Post Office.*

Life and Efficiency Tests of Tantalum Lamps.—*For Messrs. Siemens.*

Investigation of Candle-power Distribution from five types of Parabolic Reflector for use on Electric Tram Cars.

Examination of Large Photographic Lens.—*For the Survey Office, Southampton.*

Spectrophotometric determinations of the absorption of Coloured Glasses.

Redetermination of Freezing Point of Mercury in connection with verification of Low Temperature Thermometers.

Suitability of various types of Glow Lamp for Signalling Purposes.—*For the Admiralty.*

Experiments on Prism Binoculars.—*For the Admiralty.*

Examination into the accuracy of Taps for Screws.—*For the Engineering Standards Committee.*

Verification of Twelve Measuring Blocks.—*For the Government of India.*

Series of Tests on Carbon Brushes.—*For the Admiralty.*

Special Tests on a Large Resistance Box.—*For the India Office.*

Examination into the Design of Ammeter, Voltmeter and Shunts—*For Messrs. Crompton & Co.*

Solubility and Absorption Tests of Uralite and Kent Slab.—*For the India Office.*

Tests on Bohemian Glass Flasks.—*For the India Stores Depot.*

Correction and Calibration of Three Leading Screws. Density of Five Steel Blocks. Heating and Cooling Curves of Ten Samples of Steel.—*For the Ordnance Factories, Royal Arsenal, Woolwich.*

Complete series of Tests on Oil for Insulation Purposes: Resistivity, Dielectric Strength, Freezing Point, Chemical and Evaporation Tests.—*For Prices' Patent Candle Co.*

Verification of 56 Sykes' Hydrometers.—*For the Government of Victoria.*

Determination of Critical Points of certain Alloys.—*For Mr. R. A. Hadfield.*

1906.

Arrangements for Tests on Leather Measuring Apparatus.—*For Connolly's Areameter Co., Ltd., and at request of Board of Trade.*

Work in connection with the International Steel Research.

Analysis of Magnetic and Tidal Observations of the Scottish National Antarctic Expedition.

Tests on the Melting Points of certain Refractory Substances.—*For R. A. Hadfield.*

Investigations undertaken for the *Engineering Standards Committee* :—

(1) Tests made with a view to drawing up a Standard Specification for Glow Lamps.
(2) Tests on Screws with a view to fixing tolerances.
(3) Measurements in connection with Hardening Tests on Screw Gauges.

Complete Test of a 12-inch Newall Measuring Machine.—*For the Admiralty.*

Determination of Coefficient of Expansion of a 10-foot Bar belonging to the Standards Department of the Board of Trade.—*For the Department.*

Complete Calibration of a Nickel Steel Metre.—*For the Cairo Survey Department.*

Standardization of Survey Tapes.—*For the Soudan Survey.*

Complete Series of Tests on Accumulators.—*For the Premier Accumulator Co.*

Report on Design of Ammeters and Voltmeters.—*For the Ediswan Co.*

Report on Design of Hot Wire Ammeters.—*For the Admiralty.*

Tests on High Voltage Lamps for use as Standards. Inter-comparison of Standards of Light with the Bureau of Standards, Washington.

Investigation as to the Constancy of the Pentane Standard Lamp.

Tests on Large Photographic Lenses for the Reproduction of Maps.

Investigation as to the Resistivity of Insulating Materials at High Temperatures.—*For the Thermal Syndicate.*

Tests on Cellulose.—*For the Post Office.*

Tests on a remarkably Non-magnetic Steel.—*For Vickers, Son & Maxim.*

Investigation of the Ewing Hysteresis Tester.—*In connection with work done for Messrs. Lysaght & Co.*

Tests on Sheet Iron under very high Magnetization.—*For G. Schultz & Co.*

Series of Tests on Electrolytic Carbons.—*For Brunner, Mond & Co.*

Examination of the Picou Permeameter.—*For J. H. Agar Baugh.*

Investigation into the Properties of Aluminium Bronze Alloys.—*For the Alloys Research Committee of the Institution of Mechanical Engineers.*

IV.—ANALYSIS OF TEST WORK, INCLUDING WORK DONE AT OBSERVATORY DEPARTMENT, FOR THE YEARS 1904–1906.

Physics Department.

Electricity and Magnetism.

	1904.	1905.	1906.
Resistance Coils	131	85	113
Resistance Boxes and Testing Sets	152	80	153
Condensers	2	19	2
Conductivity Tests	34	65	37
Permeability and Hysteresis Tests	9	17	11
Inductance Tests	2	1	3
Ammeters	12	167	130
Voltmeters	32	112	84
Ohmmeters	—	—	7
Supply Meters	5	9	46
Shunts	—	301	45
Permanent Magnets	—	—	1
Potentiometers	16	10	10
Galvanometers	—	—	35
Wattmeter	—	—	1
Standard Cells	11	22	55
Secondary Cells	1	3	24
Insulation and Dielectric Strength	4	17	2
Miscellaneous	4	19	11
	415	927	770

Thermometry.

	1904.	1905.	1906.
High Range Thermometers	77	107	121
Low Range Thermometers	4	—	16
Open Scale Thermometers	10	8	21
Platinum Resistance Thermometers	1	3	1
Melting Point of Alloys	—	4	1
Freezing Point of Liquids	—	1	1
Thermocouples	3	41	25
Thermocouple Indicators	—	—	2
Pyrometers	—	—	27
Callendar Griffiths Bridges	3	2	1
Miscellaneous	43	28	5
	141	194	221

Metrology.

Micrometer	1	—	—
Coefficients of Expansion	11	8	14
Gauges	157	294	384
Scales	10	38	18
Areameters	—	—	22
Density Determinations	—	5	—
Miscellaneous	39	7	7
	218	352	445

Testing of Glass Vessels and Weights.

Glass Vessels, Burettes, Flasks, &c.	365	604	760
Chemical Weights	75	94	56
	440	698	816

Metallography.

Photomicrographs of Specimens of Metals	84	16	—
Cooling and Heating Curves	14	23	—
	98	39	—

Chemical Tests.

Complete Analyses*	22	48	6

Microscopical Tests.

Slides of Water Deposit	3	—	—
Samples of Paper	—	3	—
	3	3	—

Optics.

	1904.	1905.	1906.
Pentane Lamps	8	5	—
Incandescence Lamps	447	110	205
Gas Mantles	34	—	—
Photographic Lenses	6	8	18
Optical Constants	2	12	1
Prisms	—	30	3
Arc Lamp Carbons	—	5	5
Miscellaneous	—	10	4
	497	180	236
	1,834	2,441	2,494

ENGINEERING DEPARTMENT.

	1904.	1905.	1906.
Gauges (Vacuum and Pressure)	24	62	30
Strength of Materials	80	98	21
Steam Pipe Lagging	3	8	—
Calorific Value of Fuel	13	4	1
Air Meter Tests	4	1	1
Alternating Stress Tests	—	—	10
Microscopical Examination	—	—	2
Screws	—	4	1
Miscellaneous	—	3	2
	124	180	68

OBSERVATORY DEPARTMENT.

	1904.	1905.	1906.
Absolute Magnetic Instruments	13	15	16
Mercury Barometers	267	244	301
Aneroid Barometers	170	143	224
Hydrometers	777	530	571
Clinical Thermometers	15,903	16,089	17,518
Other Thermometers	3,454	3,966	4,366
Compasses	29	16	48
Sextants	957	1,044	1,096
Telescopes	2,943	3,627	4,657
Binoculars	1,027	554	390
Theodolites	13	65	40
Watches	434	450	264
Chronometers	36	46	89
Milk Test	131	137	153
Miscellaneous	123	232	187
	26,277	27,158	29,920

V.—The following Table gives a list of Members of the Scientific Staff in the Physics and Engineering Departments of the Laboratory, with an *approximate* statement of the time spent—

(1) In Organization and Installation of Apparatus.
(2) In Research and Maintenance of Standards.
(3) In the Commercial Testing of Instruments and Materials.

Department.	Names of Assistants.	Percentage of time given to Installation of Apparatus, &c.	Research and Maintenance of Standards.	Test Work.
Engineering	Dr. Stanton	50	40	10
	Mr. Jakeman	15	70	15
	Mr. Bairstow	—	100	—
Thermometry	Dr. Harker	15	50	35
	Mr. Hugo	Special	20	30
Electrical Standards	Mr. Smith	5	90	5
Electricity, I	Mr. Campbell	50	25	25
Electricity, II.	Mr. Melsom	25	10	65
Electrotechnics and Photometry	Mr. Paterson	50	30	20
	Mr. Rayner	30	60	10
Metrology	Mr. Jeffcott	30	30	40
	Mr. Attwell			
Optics	Mr. Selby	Indian Tides and other work	30	10
	Mr. Hunter			
Metallurgy	†Dr. Carpenter	10	75	15
	Mr. Edwards			
Chemistry and Glass Vessels	†Dr. Caspari	20	60	20
	Mr. Gemmell			
Average percentage of time given to Organisation, &c., to Research and Maintenance of Standards, and to Test Work		29	49	22

* With a very few exceptions of special character, these Analyses have all been of materials sent for Physical or Mechanical Tests.

† These gentlemen resigned their appointments during 1906.

VI.—(1) STATEMENT OF RECEIPTS AND EXPENDITURE FOR THE YEARS, 1903–6.

Receipts.

Account.	1903.	1904.	1905.	1906.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Government Grant	4,000 0 0	4,000 0 0	5,125 0 0	5,875 0 0
Gassiot Fund	426 12 2	453 14 4	455 11 9	452 8 11
Donations and Subscriptions	1,124 3 0	2,313 13 0	2,056 10 0	1,910 10 0
Charges for work done	4,347 9 5	5,625 16 0	5,734 18 0	5,796 7 6
Charges for Commissions for Foreign and Colonial Governments	255 2 6	318 1 8	222 6 0	253 12 5
Miscellaneous Receipts	46 17 2	41 18 9	42 14 8	31 6 0
	£10,200 4 3	£12,753 3 9	£13,637 0 5	£14,319 4 10

Expenditure.

Account.	1903.	1904.	1905.	1906.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Rent, Gas, Fuel and Insurance	491 17 8	636 15 8	690 1 4	809 2 0
Salaries, Wages and Allowances	7,991 0 2	8,994 6 3	10,431 2 5	11,218 6 0
General Expenses, including Repairs, Library, Printing, Stationery, &c.	688 12 0	783 17 9	881 9 1	968 4 11
Observatory Expenses	50 3 9	39 9 1	29 7 4	43 18 5
Tests Expenses (Observatory Department)	184 1 0	183 2 8	189 3 8	231 11 9
Physics Laboratory and Workshop, Research and Tests Expenses	534 0 5	707 11 3	683 8 2	549 11 7
Engineering Laboratory	119 5 10	256 1 0	226 14 10	148 4 0
Purchase of Instruments, &c., on Commission	189 2 11	245 18 5	149 1 5	204 3 4
Purchase for Special Investigations	58 10 9	191 8 4	103 1 6	75 10 2
Tide Prediction	—	218 13 2	200 2 6	15 7 5
	£10,303 14 6	£12,257 3 7	£13,583 12 3	£14,252 19 7

(2) CAPITAL GRANTS RECEIVED FROM H.M. TREASURY FOR BUILDING PURPOSES.

1901–2.	1902–3.	1905–6.	1906–7.	Total.
£14,000	£5,000	£5,000	£10,000	£34,000.

(3) DONATIONS FOR SPECIAL EQUIPMENT.

1901.	1902.	1904.	1906.	Total.
£1,000	£2,210	£2,750	£6,200	£12160

In addition to the above various gifts of apparatus and material for experimental purposes have been received.

(4) FEES FOR TESTS.

—	1901.	1902.	1903.	1904.	1905.	1906.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Verification	2,480 7 1	2,349 2 10	2,656 16 4	2,352 12 0	2,737 19 1	3,317 11 9
Rating	389 16 8 4 11 8	531 8 10	499 1 9	475 9 2	532 16 9	381 3 4
Engineering	—	6 10 0	51 10 11	96 19 0	200 0 9*	59 6 3
Physics	—	62 12 8	298 17 5	879 0 8	887 17 5	910 14 11†
	£2,874 15 5	£2,949 14 4	£3,506 6 5	£3,804 0 10	£4,358 14 0	£4,668 16 3

(5) FEES FOR SPECIAL WORK.

Meteorological Office Allowance	400 0 0	400 0 0	400 0 0	400 0 0	400 0 0	400 0 0
Charges for Special Investigations	—	—	136 10 0	783 14 1	449 19 0	301 14 7†
India Office for Tide Prediction	—	—	325 0 0	639 5 0	639 5 0	639 5 0
Contribution towards Steam Research	—	—	75 0 0	75 0 0	—	—
	£400 0 0	£400 0 0	£936 10 0	£1,897 19 1	£1,489 4 0	£1,340 19 7

Total Fees for Work Done	3,274 15 5	3,349 14 4	4,442 16 5	5,701 19 11	5,847 18 0	6,009 15 10
Less Discount Allowed	112 0 10	106 11 7	95 7 0	76 3 11	113 0 0	213 8 4
Net Fees for Work Done	£3,162 14 7	£3,243 2 9	£4,347 9 5	£5,625 16 0	£5,734 18 0	£5,796 7 6

* This includes an item of £90 for the correction of three Leading Screws for the Royal Arsenal, Woolwich.
† An analysis of these figures is given in Tables (6) and (7) on p. 96.

(6) DETAILS OF THE FEES RECEIVED FOR TEST WORK IN THE PHYSICS DEPARTMENT DURING 1906.

	£	s.	d.
Thermometry	70	0	7
Electrical Standards	28	18	7
Electricity, I	44	0	1
Electricity, II	364	2	3
Photometry	184	2	8
Metrology	156	0	5
Optics	20	16	0
Chemistry	9	9	0
Glass Vessels	31	11	2
Weights	1	14	2
Total	£910	14	11

(7) PARTICULARS OF THE CHARGES FOR SPECIAL INVESTIGATIONS DURING 1906.

	£	s.	d.
Engineering Standards Committee—Investigations relative to Screws and Gauges	48	15	1
Work done for the Generators Sub-Committee	6	18	8
Investigations in connection with Glow Lamp Specification	57	9	0
Electrical Standards Committee of the British Association—Silver Voltameter Research	61	9	1
Royal Society—Reduction of Antarctic Observations	118	8	11
Miscellaneous	8	13	10
Total	£301	14	7

VII.—FEES FOR TESTS ON MATERIALS.

The figures given in the following table give the fees received for tests on material of all kinds during 1904, 1905 and 1906.

In the Physics Department the tests are electrical, optical, metallurgical, &c., *i.e.*, various kinds of Physical Tests which are not usually included in the phrase "Tests on Material" as employed by Engineers. With the exception of possibly some of the metallurgical tests this work is such as is done regularly at the Reichsanstalt. (Metallurgy in Berlin is dealt with at the Versuchsanstalt.)

As to the Chemical tests these, with some few exceptions of special character, were all undertaken in connection with mechanical, electrical or metallurgical tests.

In the Engineering Department the tests usually spoken of as tests on materials are the strength tests, including the ordinary breaking and bending tests.

(*a*) TABLE SHOWING FEES RECEIVED FOR TESTS ON MATERIALS IN THE PHYSICS DEPARTMENT DURING THE YEARS 1904, 1905, 1906.

	1904. £	s.	d.		1905. £	s.	d.		1906. £	s.	d.	
Electricity:												
Conductivity	24	16	0*		47	0	6*		25	1	6*	
Permeability and Hysteresis	11	10	0		21	0	0		16	6	0	
Insulation and Dielectric Strength	10	2	0†		63	4	0†		10	10	0	
Electrical and Microscopic Tests on Ferranti Cable for Sir W. Preece	20	0	0		—				—			
Specific Capacity of 16 Samples of Paper for G.P.O.	—				6	5	0		—			
				66 8 0				137 9 6				51 17 6
Thermometry:												
Melting Points of Alloys	9	2	1		1	19	0		0	18	0	
Tests of Coal and Fuel	3	3	0		—				—			
				12 5 1				1 19 0				0 18 0
Metrology:												
Coefficients of Expansion	8	10	9‡		7	17	0‡		11	2	0‡	
Densities of 5 Blocks (for Col. Holden)	—				0	15	0		—			
				8 10 9				8 12 0				11 2 0
Metallography:												
Photomicrographs, &c.	50	7	0		8	18	0		—			
Cooling Curves	10	18	0		17	6	6		—			
				61 5 0				26 4 6				
Chemistry Tests	62	17	0	62 17 0	82	17	0	82 17 0	9	9	0	9 9 0
Microscopical Slides of Water Deposit (Inst. Mech Engnrs.)	1	10	0		—				—			
Tests—Samples of Paper, G.P.O.	—				1	0	0		—			
				1 10 0				1 0 0				
Optics:												
Optical Constants	0	10	0		4	17	6		0	5	0	
Arc Lamp Carbons	—				17	11	6		4	0	0	
				0 10 0				22 9 0				4 5 0
Total				£213 5 10				£280 11 0				£77 11 6

(*b*) TABLE SHOWING FEES RECEIVED FOR TESTS ON MATERIALS IN THE ENGINEERING DEPARTMENT DURING THE YEARS 1904, 1905, 1906.

	1904. £	s.	d.	1905. £	s.	d.	1906. £	s.	d.
Strength of Materials	51	10	2	49	9	3	13	8	6
Steam Pipe Lagging	4	19	0	27	0	0	—		
Calorific Value of Fuel	9	0	0	0	15	0	0	15	0
Alternating Stress Tests	—			—			19	0	0
Microscopical Examination	—			—			1	0	0
Miscellaneous	—			2	2	0	—		
Total	£65	9	2	£79	6	3	£34	3	6

VIII.—TESTS DECLINED.

Among the tests declined, the following may be noted. In the earlier years tests were declined frequently for want of equipment.

1902.

Testing of Glow Lamps.—*Office of Works.*

Standards of Light and Photometry.—*Board of Trade and Westminster Testing Laboratories.*

Testing of Electric Fans.—*Office of Works.*

Testing of Oil Flash Point Apparatus other than that certified by the Board of Trade.—*Various makers of apparatus.*

Testing of Ammeters up to 1000 ampères.—*Tyneside Electric Power Co.*

* A large number of these were middle rail tests.
† £9 15s. in 1904 and £57 2s. 6d. in 1905 for tests on Insulating Materials for Admiralty.
‡ A large number of these were determinations of the coefficients of expansion of scales, and were therefore not tests on materials.

Testing of Alternate Current Meters of various kinds up to 2000 Watts.—*British Schuckert Electrical Co.*

Testing of Globe Strain Insulators for Tramway Work at high alternating potential.—*Faraday House.*

General enquiry as to testing high voltage alternating Instruments.—*British Westinghouse Co.*

Standards for extremely low temperatures.—*Reichsanstalt, Berlin.*

Specific Heat and Latent Heat of Petrol.—*Capt. Longridge, Daimler Motor Co.*

1903.

Analysis of Oils—Mechanical Tests of Wire Ropes.—*Eastern Telegraph Co.*

Tests on 3-phase Recording Apparatus.—*Cordoba Light and Power Co.*

Tests on 3-phase Apparatus.—*La Capital Tramways Co., Buenos Ayres.*

Tests of Alternating Current and 3-phase Meters.—*Aron Meter Co.*

Tests of Steel Tapes, &c., used in survey work.—*E. P. Cotton.*

1904.

Tests on Boiler Plates.—*Marine Department of Board of Trade.*

Strength Tests on Cement.—*Swansea Waterworks.*

Series of Strength Tests outside the limits of the existing testing machine.—*F. W. Harbord, representing Steel Commission appointed by the Government of Canada.*

Tests relative to tinning of Copper Vessels. Declined as purely chemical.—*St. James's Gate Brewery, Dublin (Guinness's).*

Analysis of Oil derived from Seed. (Sent to Imperial Institute).—*J. Franklin, Nairobi.*

1905.

Tensile Tests of Ropes, Wires, &c.—*J. A. Mays.*

Tests of Bolts.—*B. T. H. Co.*

Patent Circulator in connection with Boiler Tests.—*O. P. Macfarlane.*

Tests on Copper Wire. Declined as purely chemical.—*London Electric Wire.*

Horse Power Tests on a Petrol Motor.—*S. Barber.*

Tests on Automatic Railway Coupling.—*A. Paget.*

Analyses of Brass and Aluminium.—*D. Napier & Son.*

Analysis of Brass.—*R. W. Bailey Clarke.*

Analyses of Rubbers for Adulteration.—*Pritchard's Gold Dredging Co.*

Chemical Analysis of Petroleum and Petroleum Products.—*W. J. Cousins.*

1906.

Tests on Copper Wire for conductivity and chemical composition. Chemical test declined.—*Bertram Blount.*

Tests on Storage Cells at Company's Works.—*N. S. Electrical Storage Co.*

Tensile Tests and Analyses. Latter declined.—*G.N.R.*

Tests on Cement.—*Lt.-Col. F. H. Western.*

Chemical Analysis, Arsenic in Copper Bar.—*F. Merricks.*

Chemical Analysis.—*Borough of Smethwick.*

Thermal Tests on Calculating Machine.—*Moneyweight Calculating Machine Co.*

Chemical Analyses—*Isaac Storey & Sons.*

Chemical Analysis of Limestone.—*Major H. A. D. Fraser (Kashmir Durbar).*

Tests of Stoneware and Cement Pipes.—*Molesworth and Roechling.*

Insulating Tube.—*Meirowski & Co.*

Efficiency of Steam Turbine.—*C. Tuckfield.*

Tests on Rotary Steam Engine.—*W. D. U. Gooch.*

Effect of Water on Gutta Percha.—*Eastern Telegraph Co.*

Steel Analysis.—*Armstrong, Whitworth & Co.*

APPENDIX II.

(*a*) Correspondence between the Institute of Chemistry and the National Physical Laboratory, 1904, 1905, 1906.

(1) *Institute of Chemistry to the Rt. Hon. Lord Rayleigh, F.R.S., Chairman of the Executive Committee of the National Physical Laboratory.*

30, Bloomsbury Square, W.C.,
20th January, 1904.

My Lord,—I am desired by the Council of the Institute of Chemistry to address you on a matter which they feel to be one involving an important point of principle affecting the interests of the profession of analytical and consulting chemistry. I refer to the action of the Director of the National Physical Laboratory in giving a certificate on a material, then the subject of proceedings under the Sale of Food and Drugs Acts, which certificate was used subsequently at the hearing of the case and testified to by the personal attendance of an assistant on the Laboratory Staff.

The Council feel strongly that in undertaking work of this kind, the National Physical Laboratory has gone quite beyond the purpose contemplated when it was founded, and in respect of which it is now maintained by public funds. They feel, moreover, that such action, if continued, must work detrimentally to and encroach upon the liberties of analytical and consulting chemists. The Council of the Institute of Chemistry, therefore, would wish to be assured that the Executive Committee of the National Physical Laboratory neither approve nor will allow the continuance of such procedure.

I am, my Lord,
Yours faithfully,
(Signed) David Howard,
President.

(After formal acknowledgment).

(2) *Lord Rayleigh to Institute of Chemistry.*

The President, Institute of Chemistry.

Sir,—In further reply to yours of January 20th, I have no difficulty in assuring you that the Executive Committee of the National Physical Laboratory have no intention of interfering with "the liberties of analytical or consulting chemists," or of encroaching on the work discharged by the Institute of Chemistry.

The chemical work of the Laboratory is described in the following extract from the Test Pamphlet and is in direct connection with the mechanical, thermal or electrical tests.

"*Chemistry.*

"This Division undertakes work in connection with materials sent to the Laboratory for other tests.

"(*a*) Complete qualitative and quantitative analyses of substances, inorganic and organic.

"(*b*) Gas analyses. The Laboratory is fitted with a McLeod gas analysis apparatus. It is hoped to be in a position to execute gas analyses with this apparatus shortly.

"(*c*) Determination of the flash-point of oils.

"(*d*) The chemical effects of thermal, electrical and mechanical treatment of substances."

It may happen in connection with the metallurgical or other work of the Laboratory a chemical test is all that is required on a given specimen, but except in such cases, chemical work is limited to work done on materials sent for complete tests.

The Director wishes me to state that he is in entire agreement with these views and that the special piece of work to which reference was made in your letter was undertaken by inadvertence in consequence of a misunderstanding on his part, and without any intention of contravening the above clauses.

I have the pleasure of sending under separate cover copies of the Test Pamphlet of the Laboratory, which may be of interest to your Council, and trust that this letter will prove satisfactory to them.

I am, Sir,
Yours faithfully,
12th February, 1904. (Signed) Rayleigh.

(3) *Institute of Chemistry to the Chairman of the Executive Committee of the National Physical Laboratory.*

30, Bloomsbury Square, W.C.
27th May, 1905.

The Rt. Hon. Lord Rayleigh, O.M., D.C.L., F.R.S.,
10, Downing Street, S.W.

My Lord,—The Council of the Institute of Chemistry has been informed that Mr. Edward Bevan, F.I.C., President of the Society of Public Analysts, has brought to your notice some correspondence which indicates that the National Physical Laboratory is used for the practice of commercial analysis, notwithstanding the kind assurance given by you in your letter to me of the 12th February, 1904, that the Executive Committee had no intention that the Laboratory should be so used.

On behalf of the Institute, I desire most respectfully to urge that the staff of the Laboratory should not undertake work which lies within the province of the practising chemist.

I beg to remain, my Lord,
Yours faithfully,
(Signed) David Howard,
President.

(4) *Lord Rayleigh to Institute of Chemistry.*

The National Physical Laboratory,
Bushy House,
Teddington, Middlesex,
26th June, 1905.

Sir,—In reply to your letter of the 27th ult., as to the chemical work in the National Physical Laboratory, I beg to enclose herewith copy of a letter addressed to the President of the Society of Public Analysts which will, I trust, allay the apprehensions of your Council as to the work undertaken at the National Physical Laboratory.

I am, Sir,
Yours faithfully,
(Signed) Rayleigh.

The President,
The Institute of Chemistry,
30, Bloomsbury Square, W.C.

[Copy.]

The National Physical Laboratory,
Teddington, Middlesex,
25th June, 1905.

Sir,—Your letter of 18th May, 1905, relative to chemical work at the National Physical Laboratory has been considered by the Executive Committee of the Laboratory, who have had before them the whole of the correspondence and details as to the chemical work which has been done. The Committee do not find that there has been any deviation in the scope of the work from the lines laid down in the Test Pamphlet, nor does your letter bring any such to their notice.

The Test Pamphlet, copies of which were sent with my letter, contains the statement that the Chemical Division "undertakes work in connection with materials sent to the Laboratory for other tests," and except in very few cases sanctioned by the Committee, this rule has been adhered to.

The exceptions consist of some special work for a Government Department, an experiment in which it was found impossible to complete the mechanical test without new equipment, and tests made on four occasions for donors to, or benefactors of, the Laboratory.

With regard to the letters, copies of which you have sent, that addressed to Mr. Charles Smith was accompanied by a copy of the Test Pamphlet in which, p. 40, the limitations in the chemical work are clearly stated. The letter to Mr. Clark, signed by Dr. Caspari, was written in the Director's absence and assumed the conditions of test as known. It was a reply to a simple request for charges. However, the Director on his return, wishing to make sure that this point was clear, wrote definitely stating that the Laboratory Committee desire that we should not "diverge from our practice of only making chemical analyses in cases in which materials are submitted to us for physical tests." A copy of this letter, which is not included in those sent by you, is enclosed. In his letter to Mr. Cousins as to petroleum products, the Director enclosed the Test Pamphlet and stated the conditions of test.

The Committee have no wish to diverge from the practice as stated in the Test Pamphlet, chemical work is necessary in many of the physical tests for which the Laboratory was founded. In addition to this, it will also be required in certain branches of Government work, or, as stated in my original letter, in connection with the metallurgical work of the Laboratory. From time to time other exceptions to the rule may occur, such as a case in which a confirmation of an analysis is required, but these will probably be few in number. One of the objects for which the Laboratory was founded was "testing materials." Such tests are ordinarily physical or mechanical in their nature; if, however, a chemical determination is required to make the test complete, such determination comes within the scope of the Laboratory work.

I am, Sir,
Yours faithfully,
(Unsigned)

The President,
The Society of Public Analysts.

[Copy.]

18th April, 1905.

R. W. Bailey Clarke, Esq.,
Holly Lodge,
Church Cobham,
Surrey.

Dear Sir,—In continuation of the correspondence with regard to the chemical analyses of brass, the Laboratory Committee are of opinion that at present we should not diverge from our practice of only making chemical analyses in cases in which materials are submitted to us for physical tests. Unless, therefore, you desire to have some of the physical qualities of properties of your brasses examined along with the chemical, we should not be able, as at present advised, to undertake the work.

I am, Sir,
Yours faithfully,
(Signed) R. T. Glazebrook,
Director.

[Lord Rayleigh's letter was formally acknowledged on the 28th June.]

(5) *Institute of Chemistry to the President of the Executive Committee of the National Physical Laboratory.*

30, Bloomsbury Square, W.C.,
1st July, 1905.

The Rt. Hon. Lord Rayleigh, O.M., D.C.L., F.R.S.,
Terling Place, Witham, Essex.

My Lord,—I submitted your letter of the 26th ult. to the Council of the Institute of Chemistry yesterday.

I am requested to ask whether you would be so kind as to allow one or two Members to confer with you on this matter, and, in that event, may I ask if you could make an appointment during the coming week.

I am, my Lord,
Yours faithfully,
(Signed) David Howard,
President.

(6) *Lord Rayleigh to Institute of Chemistry.*

Terling Place,
Witham, Essex,
3rd July, 1905.

Dear Sir,—I could meet you or other Members of the Council of the Institute of Chemistry on Wednesday, the 5th, at 4.30, at the Royal Society, Burlington House, if that would suit. But perhaps I ought to say that I have no authority to say more than was contained in my letter.

I shall be obliged if you will send a reply to 10, Downing Street, Whitehall.

I remain,
Yours faithfully,
(Signed) Rayleigh.

[The interview took place. Mr. David Howard, President of the Institute was accompanied by Dr. Edward Divers, F.R.S., then President-elect of the Society of Chemical Industry, Mr. Edward Bevan, then President of the Society of Public Analysts; Mr. Bertram Blount, and the Registrar. Lord Rayleigh promised to lay the matter before the Executive Committee of the National Physical Laboratory. Subsequently, a further interview took place between the Executive Committee of the Laboratory and a number of representatives of the Society of Chemical Industry (all of whom were Fellows of the Institute of Chemistry), at which it was agreed that the

Committee would consider a letter from the President of the Society of Chemical Industry with suggestions as to the modification of the letter from the National Physical Laboratory dated the 25th of June, 1905, and would revise the "Test Pamphlet" containing the list of work undertaken at the Laboratory.]

(7) *Institute of Chemistry to the President of the National Physical Laboratory.*

30, Bloomsbury Square,
London, W.C.,
13*th November*, 1905.

The Rt. Hon. Lord Rayleigh, O.M., D.C.L., F.R.S.,
Chairman of the Executive Committee of the
National Physical Laboratory.

My Lord,—May I remind you of the interview which you kindly allowed to a number of representatives of the Council of the Institute of Chemistry at the Royal Society on the 5th of July last, when they laid before you their views as to the undesirability of the staff of the National Physical Laboratory undertaking routine tests.

I learn that a further interview took place between the Executive Committee of the Laboratory and a number of representatives of the Society of Chemical Industry, at which it was agreed that the Executive Committee would consider a letter from the President of the Society, with suggestions as to the modification of the letter addressed by the Director of the Laboratory, on 25th June, to the President of the Society of Public Analysts, which was also sent to the Society of Chemical Industry, and to the Institute of Chemistry, and would revise the "Test Pamphlet" containing the list of work undertaken at the Laboratory.

Notwithstanding that changes might follow on the consideration of these suggestions, an article, by the Director of the National Physical Laboratory, appeared in the Engineering Supplement of *The Times* dated the 27th of September last, which could only be interpreted as showing an inclination on the part of the Director to disregard the opinions laid before the Executive Committee by those interested in the welfare of professional chemists. This action, however, served one good purpose in illustrating the justice of our views, inasmuch as the articles and correspondence which have appeared on the subject in *The Times* and other journals, since that date, have severely criticised the practice which we wish to see discouraged. In the interests of the Laboratory, it is the desire of the Council of the Institute of Chemistry to avoid public controversy on the matter, and for the present, therefore, I am requested to ask you again to be so kind as to submit the views held by professional chemists to the Executive Committee of the National Physical Laboratory for their grave consideration.

The Council of the Institute are of opinion that the Laboratory is not justified, under the provisions of the Report of the Treasury Committee, 1898, which define the objects for which it was founded, in undertaking routine tests, whether chemical or physical, which can be and are carried out efficiently by private practitioners.

The Director, in his letter to the President of the Society of Public Analysts, dated the 25th of June, states that "one of the objects for which the Laboratory was founded was 'testing materials.'" In the first place, the question of testing materials was outside the terms of reference to the Treasury Committee. It is not surprising, therefore, to find that the inclusion of work of this kind in the recommendations of the Committee was accompanied by a very careful definition of what was intended. The term "testing materials" which appears in the first of the conclusions of the Report, can be interpreted only in conjunction with Section 9 of the general body of the Report, wherein it is stated that:—

> "It would neither be necessary nor desirable to compete with or interfere with the testing of materials of various kinds as now carried out in private or other laboratories; but there are many special and important tests and investigations into the strength and behaviour of materials which might be conducted with great advantage at a laboratory such as is contemplated in the reference."

From this it appears that the Treasury Committee employed the term "materials" in the general sense and did not refer to the testing of particular *samples* of materials.

As illustrations of the kind of work for which the Laboratory was founded, the Committtee suggested a number of investigations, but they repeated that the work should not be such as is conducted in private laboratories, but such as can be undertaken only at a public institution aided by public funds. They give further examples of work which might be undertaken by such an institution

> "as distinguished from the ordinary testing of materials used in commerce, or in construction and machinery, which can be and is now efficiently conducted at private establishments."

Moreover, as might be expected, this Section appears particularly to indicate that the Laboratory was to be for *Physical* Testing, and it is very emphatic in deciding that it should not be used for tests such as are now efficiently conducted in private establishments.

I would draw your attention also to Section 24, which includes this statement —

> "The results of the investigations undertaken at the request of private individuals should, except in special cases to be approved beforehand by the governing body, be published, or be accessible to the public. . ."

It would be absurd to suppose that there would be any necessity to provide for the publication of the results of routine tests.

Generally such routine testing of particular samples of materials does not come within the terms of Section 9 of the Report of the Treasury Committee, is not of *national* importance and should not be conducted by a public state-aided institution; and those portions of the "Test Pamphlet" which relate to tests and analyses of this description should be deleted.

To facilitate the consideration of the matter, a copy of this letter has been forwarded to each Member of the Executive Committee of the Laboratory.

I beg to remain, my Lord,
Yours faithfully,
(Signed) David Howard,
President.

(8) *Lord Rayleigh to Institute of Chemistry.*

The National Physical Laboratory,
Bushy House,
Teddington, Middlesex,
18*th November*, 1905.

Dear Sir,—I am desired by the Executive Committee of the National Physical Laboratory to acknowledge your letter of the 14th November, and to say that the important questions with which it deals, are having the very careful attention of the Committee.

I am, Sir,
Yours faithfully,
(Signed) Rayleigh.

The President, the Institute of Chemistry.

[Further Reply.]

The National Physical Laboratory,
Bushy House,
Teddington, Middlesex,
18*th December*, 1905.

Dear Sir,—Your letter received 15th November, 1905, came before the Executive Committee of the National Physical Laboratory on Friday last. On the previous day I had received a letter on the same subject from the Society of Public Analysts which was also laid before the Committee.

In view of their desire to deal with the two letters simultaneously, and of the fact that time had not permitted the circulation to Members of the Committee of the letter from the Society of Public Analysts, it was decided with regret that it was necessary to defer the final drafting of the reply to your letter until the next meeting of the Committee.

I am, Sir,
Yours faithfully,
(Signed) Rayleigh.

The President, Institute of Chemistry.

[Further Reply.]

The National Physical Laboratory,
Bushy House,
Teddington, Middlesex,
22*nd January*, 1906.

The President, Institute of Chemistry.

Sir,—The Committee of the National Physical Laboratory have had under discussion your letter received 15th November, 1905, relative to chemical work at the Laboratory.

The Committee believe that up to the present the Laboratory has not interfered with the ordinary work of

professional analysts, and they have no intention of conducting it so as to cause such interference in the future.

The accounts show that the amount of the routine chemical work undertaken, apart from physical and mechanical tests, has been trifling. In the case of the few tests which have been made there have been special reasons why the Committee should undertake these. The fees received for these tests amounted in 1904 to £7 17s. 6d., and in 1905 to £16 16s., the total receipts from fees for the general work of the Laboratory being nearly £6,000.

They have under consideration suggestions received from the Council of the Society of Chemical Industry as to the wording of the Test Pamphlet, and propose to make certain changes which will, they believe, do away with any ambiguities which may at present exist.

I should like to explain that the article in *The Times* was written by the Director some time before its publication in response to a special request that he would explain at length the distinction between the work of the National Physical Laboratory and that of a University Laboratory and deals with this question in detail. That was the sole object of the article. The Director did not prepare it with the object of attracting additional chemical tests.

The Committee are fully alive to the conditions attached to their work by the Report of the Treasury Committee and have always had the recommendations of the Report before them.

I am, Sir,
Yours faithfully,
(Signed) RAYLEIGH.

(9) *Institute of Chemistry to the President of the Executive Committee of the National Physical Laboratory.*

30, Bloomsbury Square, W.C.,
24th February, 1906.

The Right Hon. Lord Rayleigh, O.M., D.C.L., F.R.S., Chairman of the Executive Committee of the National Physical Laboratory, Bushy House, Teddington.

MY LORD,—Your letter of the 22nd ult., which has already been acknowledged, has been under the careful consideration of my Council, and I have the honour to reply on their behalf.

The Council are gratified to know that the Executive Committee intend to observe and to adhere to the conditions relating to routine tests attached to their work by the Report of the Treasury Committee, 1898 (C. 8976).

They will be glad to learn that they are right in their belief that in the statement of the work of the National Physical Laboratory as set forth in the Test Pamphlet issued by the authorities of the Laboratory, the term "testing materials" means the testing of materials as such and not the routine testing of samples as such, the results of which testing could not be published as of general scientific interest.

I am, my Lord,
Yours faithfully,
(Signed) DAVID HOWARD,
President.

(10) *Lord Rayleigh to Institute of Chemistry.*

The National Physical Laboratory,
Bushy House,
Teddington, Middlesex,
21st May, 1906.

The President,
The Institute of Chemistry of Great Britain and Ireland,
30, Bloomsbury Square, W.C.

SIR,—The Committee of the National Physical Laboratory have given your letter of 24th February their careful attention.

According to the conclusions of Lord Rayleigh's Committee the Laboratory was established for standardising and verifying instruments, for testing materials and for the determination of physical constants.

In the opinion of the Committee, physical and mechanical tests on samples of materials are required in order to carry out this work, and their performance falls within the scope of the duties assigned to them.

The Committee are fully aware of the valuable work done by private individuals in testing materials and like investigations. It is no part of their object to interfere with such work; on the contrary they believe that their efforts, by showing the necessity for increased tests, will add largely to the work of private individuals.

Yours faithfully,
(Signed) RAYLEIGH.
President.

(11) *Institute of Chemistry to the President of the Executive Committee of the National Physical Laboratory.*

4th July, 1906.

The Right Hon. Lord Rayleigh, O.M., D.C.L., F.R.S., Chairman of the Executive Committee of the National Physical Laboratory, Bushy House, Teddington.

MY LORD,—The Council of the Institute of Chemistry have considered your letter of 21st May, already acknowledged in reply to the Council's of 24th February.

The third paragraph in the letter runs "in the opinion of the Committee, Physical and Mechanical Tests on samples of materials are required in order to carry out this work" (that is the work which the National Physical Laboratory was established to perform), "and their performance falls within the scope of the duties assigned to them." As a statement of fact this is admitted, but it does not answer the question asked, and, in order to remove any misapprehension, the Council would esteem it a favour if the Executive Committee would furnish them with answers to the following questions:—Is the National Physical Laboratory prepared to undertake physical and mechanical tests of materials, of a routine character, such as are already adequately performed by private practitioners? As a concrete case, will the National Physical Laboratory undertake the testing of steel as ordinarily performed commercially, to decide whether or not it complies with a given specification?

I beg to remain, my Lord,
Yours faithfully,
(Signed) PERCY F. FRANKLAND,
President.

(12) *Lord Rayleigh to Institute of Chemistry.*

The National Physical Laboratory,
Bushy House,
Teddington, Middlesex,
26th July, 1906.

SIR,—The Executive Committee of the National Physical Laboratory had before them at their last meeting your letter of the 4th of July as to tests at the Laboratory. They desired me to say in reply that the matter is now under the consideration of H.M. Treasury, and in view of this fact they have nothing to add to their former letters.

I am, Sir,
Yours faithfully,
(Signed) RAYLEIGH.
Chairman.

The President, the Institute of Chemistry.

(*b*) CORRESPONDENCE addressed to the Treasury by the Institute of Chemistry.

(1) Institute of Chemistry of Great Britain and Ireland,
30, Bloomsbury Square,
London, W.C.,
9th April, 1906.

The Rt. Hon. H. H. Asquith, M.P.,
Chancellor of the Exchequer,
The Treasury, Whitehall, S.W.

SIR,—A grant of £10,000 for the National Physical Laboratory is included in the Estimates about to be considered by the House of Commons. A large body of opinion, including that of members of the scientific professions, is strongly in favour of the bestowal of public money for the proper public purposes of the National Physical Laboratory. The work of the National Physical Laboratory, as defined in the Report of the Treasury Committee which called it into existence, is primarily an extension of the work of Kew Observatory, namely, the standardisation of instruments; to this is joined the duty of scientific and technical researches on the determination of physical constants and the investigation of the properties of materials. The whole of this work is to be so chosen that it is of national value, and, in order that it may be generally accessible, it is to be published.

In the Report of the Treasury Committee referred to above, the execution of commercial testing of materials whether mechanical or chemical is forbidden, no doubt chiefly on public grounds, but, in addition, on the ground that the National Physical Laboratory is not to compete with existing establishments where work of this kind is, and has been for many years, carried on in an efficient manner.

Unfortunately, the National Physical Laboratory has not observed the limitation prescribed for it in the Report of the Treasury Committee, and has invited and executed commercial testing, both mechanical and chemical. Recently, as the result of strong representation of the impropriety of this course, the National Physical Laboratory has expressed the intention of refusing one class of commercial testing, namely, chemical analysis, unless such analyses are carried out in conjunction with mechanical tests. But, as a fact, chemical analyses and mechanical and physical tests are constantly made conjointly for commercial purposes, and whilst either or both are carried out by the National Physical Laboratory, the limitations set out in the Report of the Treasury Committee are infringed.

As it is much to be regretted that a large and reputable body of opinion should be alienated by a course of action which the Treasury Committee foresaw and forbade, I would respectfully urge that when the present grant is proposed, an intimation should be made that it is contingent on an honourable understanding that the National Physical Laboratory should confine itself to purely public work and that commercial testing of all kinds should be declined.

I beg leave to enclose for your perusal (*a*) a copy of the Report of the Treasury Committee, with the significant passages underlined; and (*b*) a copy of the Test Pamphlet containing a list of the tests which the Laboratory has undertaken.

I beg to remain, Sir,
Yours faithfully,
(Signed) WILLIAM RAMSAY,
Vice-President.

(2) Institute of Chemistry of
Great Britain and Ireland,

30, Bloomsbury Square,
London, W.C.,
3rd January, 1907.

Reginald McKenna, Esq., M.P.,
Financial Secretary,
Treasury Chambers, Whitehall, S.W.

SIR,—In June and July last you were good enough to receive verbal and written communications made on behalf of the Council of the Institute of Chemistry with reference to the fact that the National Physical Laboratory was carrying out routine commercial tests on samples of materials. At an interview on 8th June, you inclined to the belief that the National Physical Laboratory did not intend to undertake the commercial testing of materials, and were good enough to indicate that any ambiguity on this point could be removed by a clear reply from the Executive Committee of the Laboratory to the two questions:—

"Is the National Physical Laboratory prepared to undertake physical and mechanical tests of materials of a routine character such as already are adequately performed by private practitioners?"

"As a concrete case will the National Physical Laboratory undertake the mechanical testing of steel as ordinarily performed commercially to decide whether or not it complies with a given specification?"

A letter in these terms was sent, but in the reply signed by the Chairman of the Executive Committee of the National Physical Laboratory, no answer to either question was given on the ground "that the matter is now under the consideration of H.M. Treasury," a statement confirmed in your letter of 31st July

The Council of the Institute of Chemistry are glad to learn that a Treasury Committee is to be formed to consider the question, and would ask that the following statement of its views on this matter may receive the same courteous consideration at your hands as was accorded to former representations.

In the view of the Council of the Institute, it is desirable that the terms of reference on which the Treasury Committee will act should be wide in scope. The Institute has consistently maintained that the question whether commercial testing of materials should be undertaken by the National Physical Laboratory is of public importance, and that its bearing on private interests, though real, is of secondary moment. If this view is accepted it is evident that the primary object of the future Treasury Committee will be to decide what are the powers of the Executive Committee of the National Physical Laboratory under the Report of the Treasury Committee of 1898, which established the National Physical Laboratory, and whether under this report it is competent for the National Physical Laboratory to undertake the commercial testing of materials. In this connection the Council of the Institute would draw your attention to the report of an address delivered to the Royal Society by Lord Rayleigh. The passage referred to reads:—

> "A question of importance has arisen as to the performance at the Laboratory" (*i.e.*, the National Physical Laboratory) "of tests, partaking of a routine character, on the physical and mechanical properties of specimens of material. To this objection has been taken on the ground of competition with the work of private establishments. In one of its aspects the question is financial. But the Executive Committee are of opinion, even if pecuniary loss were recouped, the efficiency of the Laboratory would suffer from the abandonment of this work. While anything like unfair competition with private establishments should be avoided, the execution of tests is good practice for the staff, and tends to keep them in touch with the manufacture and with the practical problems which may demand examination. In view of the difference of opinion that has manifested itself, the Treasury has decided to appoint a small Committee to inquire into the working of the Laboratory, with a special reference to this question."

In the passage quoted above, the assumption is made that only private interests will be submitted for the consideration of the future Treasury Committee. The Council of the Institute of Chemistry agree in regarding this as a necessary part of the inquiry, but believe that the importance of properly safeguarding private interests is much exceeded by that of ensuring that public uses shall be adequately served, and on that ground unhesitatingly condemn any suggestion that the inquiry of the Treasury Committee should be narrowed.

The composition of the future Treasury Committee is of an importance equal to that of the terms of reference. Seeing that the Treasury Committee will be called on to decide whether the actions of the Executive Committee of the National Physical Laboratory have been within the powers of that body, and whether the objections which have been raised to their procedure are justified or not, it is hoped that the appointment to a place on the Treasury Committee of any person whose actions are to be an object of its critical consideration, will not be thought of. Apart from this obvious necessity it is evidently requisite that the Treasury Committee should be formed of men with a special knowledge of the complex technical and scientific issues involved, in order that when the report of the Committee is made it may carry sufficient weight to be accepted on all sides. The Council of the Institute do not doubt that the whole of these matters will be taken into account by H.M. Treasury, and that the Committee finally chosen will possess the confidence of all who are anxious that the National Physical Laboratory shall take its proper position in the public service.

I am, Sir,
Yours obediently,
(Signed) WILLIAM RAMSAY,
Vice-President.

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